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OBSERVATIONS

ON TUMOURS,

WITH CASES,

BY WILLIAM LAWRENCE, ESQ., F.R.S.,

PRESIDENT OF THE SOCIETY.

READ NOVEMBER 8TH, 22ND, DECEMBER 27TH, 1831.

Few subjects in pathology and therapeutics are more interesting and important than the history and treatment of tumours, in both of which many points, and those not of slight consequence, are hitherto imperfectly understood. How are changes of structure to be distinguished in all circumstances from new formations? To what difference in the natural process is the different result in these two instances to be attributed? Do they owe their origin to the same or to different causes? Are the same or similar means capable of checking the progress of both? What are the tumours, if any, that can be arrested in their growth, diminished, or dispersed, by other means than surgical operation? What are the characters distinguishing those in which extirpation may be undertaken with reasonable expectation of permanent cure, from others of destructive and fatal character? We shall not be able to give a satisfactory answer to these and other similar questions, till we possess a more accurate history of particular tumours,

in which a minute account of their origin, progress, and symptoms shall be combined with a careful description of their structure, and of the effects of treatment.

Unless we are aware of our ignorance, we are not likely to make the exertions necessary for procuring information: hence I have been led to point out what I regard as the principal deficiencies in this branch of surgical knowledge. As these can only be supplied by the united labours of many observers, I have offered in the following pages, a small contribution of remarks and facts, hoping that they may elucidate some subordinate points, and that they may induce other members to favour the Society with the results of their experience on this important subject.

The incongruous assemblage of diseases under the order TUMORES of Cullen merely shews that when he wrote, nothing was known of tumours in the more restricted sense in which we now employ the term. The treatise on surgical diseases, of a veteran professor and hospital surgeon, published in the present century, leaves the subject in the same darkness and confusion, as will be apparent from the following enumeration of heterogeneous diseases, which he has described under the common name of tumours; viz. erysipelas, phlegmon, boil, carbuncle, malignant pustule, aneurism, varix, the vascular growths constituting nævi, scirrhus, cancer, œdema, and fatty swellings.

Mr. Abernethy was, I believe, the first surgical writer who took a more philosophical view of the subject. He shewed that the various growths constituting tumours ought to be distinguished and characterised by the differences of their anatomical structure. He pointed out the absurdity of classing together diseases, which agree in no other respect than that of causing enlargement of the affected part; and he proposed to restrict the appellation *tumour* "to such swellings as arise from some new production, which made no part of the original composition of the body." Unfortunately he does not adhere to this clear and proper distinction, but abandons it in the very same page. For he proposes to include in the definition not only such enlargements of glands as "are owing to a tumour growing in them, and either condensing the natural structure, or causing an absorption of the original gland;" but also those, which "produce an entire alteration of structure in the part; the natural organization being removed, and a new formed diseased structure substituted in its stead." Accordingly he speaks of cancer and fungus hæmatodes as tumours, although scirrhus, in its primary form, is hardly ever seen as a new production in the sense of Mr. Abernethy's definition; and he gives no example of the kind, all his cases being degenerations or changes of structure in organs. If the latter are to be included with the new productions in the definition of tumour, this term will embrace several other affections in addition to those treated of in Mr. Abernethy's essay; for

example, scrofulous and other alterations of the mamma, testicle, and various organs.

In explanation of the inconsistency into which Mr. Abernethy has thus fallen, in his very interesting and instructive essay, it may be observed, that it is not easy to draw a clear distinction between new or accidental productions and changes of structure or degenerations of organs. There is no definite boundary between them; on the contrary, as in other diseases, there is an insensible transition from one to the other. In the case of fungus hæmatodes, we find the same structure sometimes occurring as a new production, an independent tumour; sometimes as change of structure in a part. Indeed, we meet with this growth in three distinct forms: viz. as a deposit enclosed in a cyst, as an unencysted formation, and as an infiltration in the substance of an organ. Again, we find a similar gradual transition between the structures composing various kinds of tumour, so that we often hesitate in deciding to which species a particular swelling should be referred. As the same gradual blending of one form into another occurs throughout the whole field of disease, we cannot wonder that the several attempts at reducing its infinitely diversified phenomena to an artificial arrangement of classes, orders, genera, species, and varieties, should have failed so signally. They have proceeded on a false analogy, diseases having been compared to the species of natural history. The latter however are distinctions established by nature, while the former

may be compared more justly to the ever-varying results of different shades and combinations of colour. I nevertheless consider, that Mr. Abernethy's original design of confining the term tumour to new productions ought to be strictly adhered to; and that the distinction between them and changes of structure, although it cannot always be satisfactorily established in our present imperfect knowledge of these affections, is not only useful, but very important both in pathology and treatment. We cannot expect that one and the same explanation will elucidate the origin and growth of an entirely new production, and the alteration of structure in a part; nor can we suppose that common principles of treatment will be applicable in the two cases. Mr. Abernethy however makes no distinction between them in his general observations, of which those relating to treatment seem chiefly applicable to changes of structure, while such, as are intended to explain origin and growth, can only be understood as applied to new productions.

Considering that as yet we understand but imperfectly the nature of disease, and the distinctions between such of its forms as are nearly allied, we need not be surprised that it is in many instances difficult, if not impossible, to frame satisfactory medical definitions. Thus, according to Mr. Abernethy's explanation already quoted, the gravid uterus would be a tumour; since it is a swelling, caused by a new production, which made no part of the original composition of the body. The French writers seem to

me to have done well in classing these growths under the general head of *accidental productions*, as contradistinguished from those which belong to the regular or normal state of the frame; also, in separating them into two divisions, according as they are analogous to the normal tissues, or different from them, *analogues* or *heterologues;* we might say *similar* or *dissimilar*. It will of course be understood, that these run into each other by insensible gradations. We might then define tumours to be accidental productions, either similar to the normal tissues, or dissimilar, developed in the cellular or adipous structures, or in the substance of any organ. These productions are often unattended with any increased magnitude, therefore we must disregard the etymology of the word, and leave the circumstance of enlargement out of our definition.

In considering the natural history of these new or accidental productions, our first inquiry is into the mode of their origin and increase. Three explanations have been offered; first, the effusion of blood, and its coagulation, and the subsequent organisation of the coagulum; secondly, the effusion and organisation of coagulating lymph; thirdly, chronic inflammation. Although these views are essentially different from each other, they are all three mentioned in various parts of his essay, by Mr. Abernethy, who does not seem to have adopted either of them definitively. When various explanations are given of any living process, we shall find that its nature is not

understood. There can be only one true account of the matter, and when that has been discovered, the others are discarded. It seems to me in the present instance, that neither of the explanations abovementioned offers a satisfactory solution of the phenomena.

According to either of these views, tumours ought to pass through successive stages, and to present different appearances at different periods of their development. For instance, we ought to find them at first as masses of coagulated blood, or coagulating lymph, and then to observe various degrees of transition from those substances to the textures which characterise the perfect growth. Observation however discloses nothing of this kind: tumours, in their earliest state and smallest size, have their peculiar structure as well marked as in their subsequent progress and full development. An adipous tumour, not exceeding the bulk of a pea, differs only in size from one as large as the head. Effusions of blood into the cellular texture from external violence are of daily occurrence: hardly an individual escapes them. If such extravasations could become organised and then form tumours, the latter should prevail almost universally. We see however that the blood, thus poured out, either disappears by absorption, or irritates the surrounding parts, and causes suppuration, by which it is expelled. No instance has yet been adduced, in which such an effusion has been con-

verted into a tumour. The following case, which is the only fact brought forwards by Mr. Abernethy in proof of the point in question, seems to me altogether inconclusive. "A medical practitioner bruised the upper part of his thigh against the pummel of a saddle in consequence of his horse starting. The bruise and slight inflammation attendant on this accident soon disappeared; but after some months he perceived a small tumour, which gradually increased till it acquired a considerable magnitude. He came to London, and had it removed. It was an adipous tumour, and had a distinct capsule inclosing it, formed by the condensation of the cellular substance in which it had grown."*

This explanation of the origin of tumours was probably suggested by the statements of Mr. Hunter respecting the production of vessels in coagulated blood, the agency of this process in effecting the union of wounds and fractures, and its occurrence in effusions of blood into serous cavities. We now know that the adhesion of wounds and the union of broken bones, are not accomplished in this way; moreover, that these processes take place most readily where no coagula are present. I have never seen any satisfactory proof of blood becoming organised, when effused in wounds, bruises, or into serous cavities, or when deposited in aneurismal

* Surgical Observations on Tumours and Lumbar Abscesses, 1827, p. 12.

sacs; though, if the thing really takes place, daily experience ought to afford numerous and unequivocal examples.

Nothing is more frequent than the interstitial effusion of lymph in consequence of inflammation: the substance thus poured out is not formed into tumours; it is absorbed as the inflammation subsides, or its partial organisation causes the enlargement and condensation of the affected structure. None of the phenomena, usually considered as characteristic of inflammation, are observed to precede the formation of tumours. These growths occur insensibly, and often arrive at a considerable size before persons are aware of their existence.

If the preceding views respecting the origin and growth of tumours were correct, the attempts to check their production and increase by leeches, cold applications, and the antiphlogistic treatment generally, would be rational. We find however that such means exert no influence over accidental productions, although they may be employed with advantage in some of the swellings caused by changes of structure; and this marked difference in the effects of treatment is a further reason against confounding together the two kinds of disease.

I have nothing to offer in place of the explanations to which I have now objected. It seems to me

that the circumstances, which determine the production of tumours generally, or of any particular kind of growth, are entirely unknown to us: nor ought we to feel surprised at our ignorance respecting these aberrations of nutrition, when we are quite in the dark as to the mode in which the process is accomplished in its natural or normal state; when we know nothing of the differences in arrangement or operation which lead to the varied results of vascular action; when we are unable to explain how the capillary vessels of one part deposit muscle, of another bone, of a third fat; how one gland secretes bile, another urine, and a third saliva.

It may be observed generally, that the accidental productions constituting tumours frequently correspond in their structure to the parts in which they are produced. Thus we have masses of fat formed in the subcutaneous adipous tissue; and on the other hand, tumours of cellular structure occur in that kind of cellular tissue which does not contain fat. The latter are not so common as the former; and as I have not met with any clear description of this kind of growth, which may be called *cellular* tumour, as the other is termed *adipous*, I shall relate a case of it, observing only that these, like adipous tumours, are not attended with pain or any peculiar symptoms; that they may attain very considerable size; and that they become troublesome or dangerous only in consequence of their bulk.

CASE.

Large Cellular Tumour occupying the labium pudendi and buttock.

I was consulted, in the year 1826, by a lady 28 years of age, handsome, very well formed, of fair complexion and light hair. She came into my room with her sister, looking very strong and healthy, and said that she wished to have my opinion on a rupture. She turned aside to loosen her dress, that I might examine the part, and was longer than I expected in making the necessary arrangement. I looked round expecting to meet with a hernial tumour in the groin or bend of the thigh, perhaps as large as a walnut or an egg, when, to my utter astonishment, I saw hanging from one of the buttocks a mass about twice the size of my head, of which the accompanying drawings exhibit a posterior and a lateral view. It was greater in breadth than the transverse measurement of the two thighs, which, in a tall and very well made person like this lady, were of good size. The complaint had existed for four years, and had not grown fast during the first two. It had given no pain, and even at present was only troublesome by its weight, bulk, and inconvenient position. It interrupted no function, and did not even impair any; indeed the general appearance of the patient was that of perfect health and strength. It had commenced at the posterior part of the left labium pudendi, and had extended gradually along

the buttock and behind the os coccygis. The tumour was a soft, but not fluctuating mass, and slightly subdivided into large lobes. The skin was loosely connected to it, so that it could be pinched up into large folds: it had become partially excoriated from pressure and friction, and was consequently rather red and rough on the prominent parts of the swelling; but in other respects it was healthy. Some veins of moderate size could be obscurely seen on the surface. The basis was the smallest portion of the tumour, which expanded below into a pendulous mass, rather broader than the two thighs. The basis reached from the coccyx to the left labium, and from the edge of the gluteus magnus to the anus. The greatest circumference of the swelling was thirty-two inches; it was twenty-one inches round at the basis, eleven inches from the latter to the middle of its inferior edge, and eight in the line of the basis from the coccyx towards the trochanter.

The basis of the tumour was quite moveable on the subjacent parts, but it was of uncertain extent towards the front; that is, I could not determine how far it reached inwards beyond the labium, or towards the cavity of the peritoneum. The patient said that her medical attendant had thought it was a rupture, and I therefore examined carefully whether any impulse was produced in it on coughing, or whether the swelling was continued along the side of the vagina. These points were not clear, but the absence of the symptoms, which a protrusion large

enough to form such a swelling must have caused, sufficiently disproved the notion of rupture. The propriety of taking another opinion having been suggested, this lady consulted Mr. Wardrop, and we determined that the disease ought to be removed, as we could discover no connexion with any internal part, although we could not trace the boundary of the growth satisfactorily towards the labium and vagina.

I removed the tumour on the 9th of September, 1826, making two incisions, one on the outer, and the other on the inner side, and detaching integument enough to cover the denuded surface after the operation. The skin was easily separated, and the base of the tumour was readily detached from the parts beneath, its situation being quite superficial, so that merely a few fibres of the gluteus magnus were exposed. But the anterior portion, which advanced into the labium, could not be eradicated: it passed inwards along the side of the vagina, on which there was an evident drag, when this part was pulled: I therefore cut it through. The part thus divided was tough, with a compact fibrous structure, and a light reddish-grey colour. There was free bleeding from numerous vessels of various sizes, which I did not stop to tie, and a large quantity of blood was lost, when the patient became very faint, and the hemorrhage ceased, so that there was no necessity for ligatures. The edges of the incision were brought together by eight sutures, and the wound was thus as completely closed as the thickened state of the skin detached from the

tumour would admit, when the patient was put to bed in a very faint state, in which she continued till night. She, however, spoke and looked very well, so that I could entertain no apprehension about her, although the pulse at the wrist was barely perceptible. Two grains of crude opium at bed-time.

10th. She slept for three or four hours; her pulse and strength are recovered.

11th. The opiate was repeated last night, she slept well. Spermaceti dressing to the wound, which looks well. Senna mixture.

12th. The bowels were freely opened yesterday, and she slept well without an opiate. The pulse is quiet and the tongue clean; she was lifted out of bed to-day to a sofa. The sutures were cut out; the wound is free from inflammation, and dressed with dry lint and soft rags.

13th. (Evening.) She became indisposed yesterday evening with head-ache and thirst, and she passed a restless night without sleep. The head-ache continues; skin hot, pulse 120; tongue rather dry in the middle. I found that this excitement was owing to indulgence in beef-tea and other articles of nourishment, which had been liberally administered by the attendants from an idea that it was necessary to strengthen the patient after the operation, and also to conversation with some friends yesterday evening.

She was desirous of having the opiate repeated, feeling that she should not get sleep. Eighteen leeches to the temples; a dose of calomel and jalap. Diet of tea and bread.

14th. The feverish symptoms have disappeared; the pulse is quiet; tongue moist.

The case went on most favourably from this time, and the patient returned to her residence in the country, a distance of about ten miles, on the 23d, the wound being then very nearly closed.

The tumour consisted of a fleshy mass with a somewhat elastic feel, approaching nearly to fluctuation: its substance undulated and trembled when pressed or moved. On cutting through it, the texture was found nearly uniform throughout, being rather more compact on the prominent part, where it must have suffered pressure in sitting and lying, and have partaken of the irritation which had caused excoriation of the surface. Its tint was reddish grey. Its structure was tough and fibrous, and consisted of condensed cellular tissue entirely free from fat. It was left during the night in a large dish, and in the morning a very considerable quantity of fluid had escaped from it. This was not subjected to chemical analysis; it is therefore merely a conjecture that it may have been similar to the fluid frequently found in the interstices of the natural cellular tissue.

This lady, who had regained her strength rapidly after leaving London, and had continued in perfect health, paid me a visit on the 13th of March, 1827, when I examined the cicatrix and found the part quite sound. The skin, which had formed on its separation from the tumour, large thick folds, had shrunk considerably, so that the natural outline of the buttock was nearly restored. The entrance of the vagina was natural, and nothing like return of swelling could be discovered on introducing the finger. Soon afterwards she married, and I did not see her again till the spring of 1828, when she was far advanced in pregnancy, and had experienced a considerable reproduction of the tumour. It distended the loose skin left from the operation, filled the left labium at its back part, and could be felt through the vagina as a kind of cord ascending towards the pubes. She went through her confinement very well, and I removed the swelling again on the 1st of August, 1828. The anterior prolongation was carefully traced on this occasion: it ascended along the left side of the vagina, becoming gradually smaller, and seemed to pass under or behind the arch of the pubes. As I was putting it on the stretch to trace it to its termination, it suddenly gave way, and I found that it had tapered quite to a point, the end appearing entire, as if the whole morbid growth had come away. The part removed was equal to about one third of the mass formerly extirpated, which it exactly resembled in structure. The edges were brought together by su-

tures and the wound was covered with cold damp cloths. The healing went on rapidly, and the patient was able to return to the country on the eighth day. There has been no reproduction of the swelling *.

Between the cellular tumours now described, and the enormous swellings, in which the male external organs of generation are sometimes involved, more particularly in warm climates, there is this distinction—that while the former are new productions, arising and increasing insensibly, without local or general disturbance or pain, the latter are mere enlargements of the cellular and cutaneous tissues resulting from interstitial deposition consequent on repeated attacks or a long continuance of more or less violent inflammation, which is attended with the usual symptoms both in the part and in the constitution. I had occasion to remove, on account of this affection, the prepuce of a gentleman who had resided many years in the West Indies. Although the part had attained the size of my fist, I found that the increase of size was owing to distention and enlargement of the cellular tissue, with some thickening of the skin; and I was sur-

* In the course of the last year, a tumour of considerable size, exactly similar in structure to the foregoing, was removed from the left labium pudendi of a female between twenty and thirty years of age, in St. Bartholomew's Hospital, by my colleague, Mr. Earle. This growth had formed and increased slowly and without pain. It was loosely connected to the surrounding parts, except at its upper end, where it adhered more firmly by a kind of tough fibrous prolongation, which was cut through in order to detach the mass.

prised to find the affected structure not much changed in its anatomical characters.

Description of a Tumour occurring in the immediate vicinity of the parotid gland.

Mr. Abernethy has described a tumour under the name of *pancreatic sarcoma*, which, he says, "is made up of irregularly shaped masses, in colour, texture, and size resembling the larger masses which compose the pancreas. They appear also to be connected with each other, like the portions of that gland, by a fibrous substance of a looser texture."* He says, that it may occur as a distinct tumour, though it is more frequent as an affection of the female breast; and he adds, that he has preserved no notes and does not distinctly recollect any case of a tumour of this structure occurring in a distinct form †. The only example that he mentions, with the exception of some instances in the female breast, is that of a man "with three diseased lymphatic glands, each of the size of a very large plum, situated beneath the basis of the jaw upon the mylohyoideus muscle." ‡ I have seen many instances of tumour approaching in anatomical characters more or less nearly to the description given by Mr. Abernethy of the pancreatic

* Surgical Observations on Tumours, p. 34.
† Ib. p. 43. ‡ Ib. p. 35.

sarcoma, situated close to the parotid gland and near to the angle of the lower jaw; and I have once seen a similar swelling under the basis of the jaw close to the submaxillary gland. The question naturally arises whether the peculiar character of these growths can be referred to their local situation? Whether they derive their resemblance to the structure of the salivary glands from the circumstance of being formed near to them? I think that there is as much analogy in configuration and structure in this case, as we see in any instance between an accidental production and a natural part; and I have not met with a similar tumour in any other situation except in the instance related in Case V., where the new growth occupied the angle of the mouth and side of the lip, and therefore was not far from the parotid.

These swellings have an uneven, knotty, or lobulated surface, as if they were made up of masses more or less distinct. They are firm; sometimes as hard and incompressible as the most dense scirrhous swelling of the breast; sometimes not quite so hard, but still firm. They are loosely connected to the surrounding parts, and therefore easily moveable: this character they retain, however long they may have existed, and are thus distinguished from scirrhus, with which they might be confounded if the mere circumstance of hardness were attended to.

They form and grow without any pain, increasing slowly, so that at the end of five, six, or more years,

the tumour may not exceed the size of a walnut. I have not seen it larger than an orange; indeed the complaint causes so much inconvenience and deformity by its bulk, that patients usually submit to an operation before it has attained this size. It is not painful on pressure.

When the tumours of the least firm kind are cut through, they exhibit a very light brownish yellow tint, and an obscurely lobulated arrangement. The colour resembles that of scirrhus, but the texture is less hard and tough; it is softer, and instead of being hard and unyielding, it will break short off. The harder growths are very like scirrhus in density, toughness, and colour: they creak under the scalpel, and sometimes exhibit a few bony particles. Occasionally there is a partial admixture of coagulated blood, in streaks and patches, with the usual texture of the tumour, so as to lead to an apprehension that the disease might be of malignant character.

In some instances the affection has commenced about, or previously to the twentieth year; in others it has appeared later. The swelling has been on the left side in all the cases I have seen; and close on the parotid in all but two, having been in contact with the submaxillary gland in one of these, and situated in the left angle of the mouth and side of the lip in the other.

Although the texture of these growths nearly re-

sembles scirrhus, and in some instances presents other appearances calculated to excite apprehension, I have invariably found them innocent. When analogy of structure to fungus hæmatodes has been suspected from the partial presence of coagulated blood, there has been no approximation to the nature and progress of that disease. The absence of pain, and the sound state of the neighbouring lymphatic glands, through the whole course of the complaint, are well-marked distinctions between these tumours and true scirrhus. The former do not affect the surrounding textures like the latter; they do not become adherent to the skin nor to the parts beneath, but remain quite loose and moveable throughout. Neither are they connected with, nor do they lead to any morbid constitutional disposition, so that extirpation by the knife has been invariably and permanently successful, within my experience, except in a case operated on by Mr. Macilwain, where death ensued from erysipelas. They cannot be checked in their progress by external applications or medicines; the proper course of proceeding, therefore, is to remove them by the knife. This should be done early; for they increase in size, and may become so connected with the various important parts around as to make the operation difficult and dangerous.

CASE I.

The first case in which I met with this affection, was that of a young man, about twenty-two, in whom

the tumour, which was knotted, hard, and equal in size to a large walnut, was situated below the left ear and extended deeply between the mastoid process and jaw. The latter circumstance, together with profuse arterial hemorrhage, rendered the dissection difficult and tedious. On the surface of the tumour, after its removal, were found a slice of the parotid gland, and a portion of the facial nerve about three quarters of an inch in length: the latter adhered closely to the swelling. The operation was followed by partial paralysis of the left side of the face, and of the orbicularis palpebrarum. No inconvenience ensued from the wound of the parotid.

CASE II.

Mary Bray, aged 34, a thin woman of ruddy complexion and healthy appearance, was admitted into St. Bartholomew's Hospital, under my care, on the 27th of July, 1826. She states that she caught cold, and had a sore throat from sleeping in a damp bed, between seven and eight years ago. Soon after she perceived on the left side, immediately behind the angle of the jaw, a small swelling, which increased very slowly for four years, and has since grown more rapidly. She has lived abstemiously, and enjoyed good health for many years. She has now a swelling, considerably larger than a hen's egg, immediately behind the angle and ramus of the jaw: it is oval, hard, unequal on the surface, as if divided into four lobes, and easily moveable both on the subjacent parts and

under the skin. It has never been attended with pain, nor caused inconvenience of any kind. I removed it on the 28th, by a single incision of about five inches in the direction of its long axis. Profuse bleeding from several arteries took place during the operation, which was not interrupted on that account: it ceased on the occurrence of faintness. A small slice of the parotid gland was found on the basis of the tumour. The surface of the latter was tuberculated, and covered by a thin closely-adhering whitish capsule: its substance was compact and firm, approaching in colour and consistence to the softer forms of scirrhus. The cut surface had a slightly lobulated appearance; and the texture was uniform throughout. The flaps of skin were gently brought together by a few adhesive straps, which were removed the next day, the wound being then simply covered with a damp cloth. A considerable portion of the incision united by adhesion; but a copious flow of thin watery fluid took place from its middle in a few days after the operation, and continued for about ten days. On the 22nd of August she left the hospital perfectly well.

CASE III.

A female, about 45, of spare habit, had a swelling about as large as a middle-sized walnut, on the left side, a little above the angle of the lower jaw, and on the surface of the parotid gland, to which, as well as to the skin, it was connected by a loose

cellular tissue, so as to be easily moveable. It had the incompressible hardness of scirrhus, and was a little knotted on the surface. Its existence had been noticed about three years, and the patient having observed that it had increased lately, wished to have it removed, when I informed her that it could not be got rid of without an operation, although she had never experienced the slightest pain or inconvenience. The cut surface exhibited a whitish homogeneous substance without any lobular arrangement; in colour and compactness it nearly resembled cartilage, but it possessed the toughness of the hardest scirrhus. There were, however, none of the small opake white striæ or points which are usually dispersed in abundance through the latter. This growth was so hard, that it was cut with difficulty, particularly at one or two points, where, on scraping the surface with the nail, a little bony matter was detected.

CASE IV.

Mr. R., about 40, a tall and robust person, of dark complexion and hair, who had always enjoyed the best health, consulted me in the summer of 1826, on account of a large swelling over the left side of his lower jaw, which had existed for eight or ten years, increasing slowly without causing pain or inconvenience of any description. The patient, however, had lately become uneasy on account of the recent more active growth of the disease, and of its size, which caused a conspicuous deformity. It was

as large as a middle-sized orange, rather irregular on the surface; in front there was a prominent knob, equal to a large nut. The integuments were loosely connected, so that they could be pinched up, and the connexion was equally loose in all other directions. Hence the entire mass could be moved easily; but it was doubtful whether the middle of the basis might not be more fixed. There was something of an elastic feel on pressure, but no clear evidence of fluid. The evils to be apprehended from the continued growth of a large mass thus situated made me recommend its removal, although the boundaries of the disease towards the interior of the neck were uncertain; and the patient immediately consented to the operation. An incision was carried over the swelling, from the chin to behind the ear, of which the lobulus was considerably elevated by the tumour: a perpendicular incision along the cheek joined this at right angles. The tumour was quickly denuded on its external surface and sides, but it adhered more firmly at the base, and many arteries were divided in detaching it. I could not separate it in the middle, as it went obviously behind the jaw; I therefore cut it off, and in so doing opened a central cavity, from which fluid escaped. This, I believe, was clear, yellow, and of watery consistence; but, as it mixed with the blood, which was flowing in abundance from numerous arteries, its appearance and nature could not be accurately ascertained. After tying some arteries, I removed from behind the jaw what seemed to be the remainder of the disease; that is, a portion

of a cyst with thick sides, which, when fitted to the part previously removed, completed the cavity. There still, however, remained a dark, livid, bloody substance of spongy texture, going inwards behind the lower jaw. On its front edge the external carotid was beating, completely denuded for about an inch. On examining the margin of this spongy part, I found a thin white cyst, connected by loose cellular tissue, which I dissected and separated cautiously; but I could not get behind it, and I found the internal carotid beating on its posterior margin. The mass broke down readily under pressure with the finger, which passed behind the pharynx, betweenit and the spine, to the middle of the neck. I broke away what would separate easily: the fragments thus removed were dark reddish or brownish, soft, and friable. After the operation, it was observed that the mouth was drawn to the opposite side, and much distorted.

The tumour was of tolerably firm texture, with a large central cavity; and the sides of the latter were smooth. In colour, which was a light yellowish brown, or light amber, and in general appearance on a section, the texture resembled scirrhus; but it was not so compact or tough. It was invested with a thin but firm white capsule. Towards the cavity, the texture gradually changed into a red and bloody substance. No communication could be ascertained between the interior of the cavity and the spongy prolongation behind the ramus of the jaw.

The appearances above described, and particularly the character of the disease where it extended inwards, naturally suggested the question, whether the tumour was of the fungous class, and consequently malignant? Whether the part left behind would be likely to throw out a bleeding fungus, or to lead to reproduction of disease at a more remote period? Mr. Callaway, who assisted me in the operation, and other gentlemen conversant with the anatomy of morbid structures, to whom I shewed the tumour, thought unfavourably on these points. Partaking of the same impression, I gave a very bad prognosis to the patient's friends. Mr. Wardrop, however, decidedly pronounced the structure not to be malignant; and his opinion was justified by the event, for the patient had recovered, and was out in a fortnight, and has continued perfectly well to the present time.

A slow oozing of blood took place for twenty-four hours after the operation; then a bloody serum flowed pretty copiously for three or four days, the part swelling considerably, and the skin getting very red. Then matter came, at first red, and afterwards quite healthy. The whole of the wound united by adhesion, excepting the central part, where the two incisions met. A little discharge of the healthiest character still continued from this point at the end of the fortnight, and had not entirely ceased when Mr. R. left town a few days after.

Although the parotid was necessarily much cut in the operation, no inconvenience was observed to result.

The cicatrix and surrounding parts are quite healthy at this time, and there is no more fulness than on the sound side. The paralytic distortion of the face, which was considerable long after the operation, is diminished; but the left corner of the mouth still drops, and the eyelids do not meet in attempts to shut the eye, but no inconvenience is experienced from this circumstance.

CASE V.

A young lady, nineteen years of age, shewed me a tumour, occupying the left side of the upper lip and the corner of the mouth, which had existed three or four years, never giving the slightest pain, and had reached the size of a large walnut, causing great deformity. It was quite loose, and could be pushed from side to side: towards the mouth it was only covered by the mucous membrane, which was partially everted and exposed to the air in consequence of its distension by the swelling, and hence had become slightly dried. I removed it from the inside by an incision over its middle; and it was cut out in half a minute: no bleeding followed. There was no redness, swelling, nor pain; and in two days the patient was well. The surface of the tumour was knotted. Its substance was whitish, compact, tough, and almost

of cartilaginous firmness, resisting the knife so as to cut with some noise. There was a little bony matter at one point.

Mr. Abernethy seems to doubt whether the swellings in the female breast, which he mentions as illustrations of his pancreatic sarcoma, are new productions, or changes of structure either in the mammary gland or some adjacent lymphatic glands. They obviously belong to the former class, or that of new growths, being generally loose in their situation, surrounded by a distinct capsule, and exhibiting a structure which, although analogous to that of the gland in which they are more or less imbedded, is yet clearly distinguishable from it. They have been well described and delineated by Sir A. Cooper, in his "Illustrations of the Diseases of the Breast,"* under the name of chronic mammary tumour. They differ from the swellings just described by being much softer and looser in texture, and more distinctly and minutely lobulated throughout: they never exhibit the scirrhous hardness of the others. Again, they are often painful, sometimes causing severe suffering. In this latter respect, as well as in their anatomical characters, they are obviously assimilated to the part in which they are produced.

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* Chapter IV. plates 6 and 7.

On difficulties in the diagnosis between innocent and malignant growths.

The distinction between innocent and malignant tumours, which is of great importance in practice, more especially when the question of operation is to be considered, has not yet been clearly traced. We are not sufficiently acquainted, for this purpose, with the characteristic differences of the various accidental productions, nor with the external signs by which each of these may be recognised.

Tumours, which in their regular progress destroy life by the changes occurring in the affected part, such as ulceration, bleeding, sloughing, or by causing similar productions in other parts of the body, more particularly in important internal organs, or by both together, are considered malignant. The occurrence of serious local and general symptoms, the developement of new growths in other parts, and the existence of such constitutional suffering as leads to the suspicion that organs of consequence are involved in the affection, would generally be regarded as decided proofs of malignant character and insuperable objections to an operation. Mr. Abernethy has described a disease, exhibiting these alarming features, under the name of *tuberculated sarcoma*, which he seems to have chosen in consequence of the secondary growths consisting of small hard masses or *tubercles*. He says that it " appears to possess a very malignant

nature."* A case has come under my observation, in which the original tumour had assumed a most threatening aspect, in which several smaller swellings had shewn themselves in other parts, and the patient had been brought to the brink of the grave by severe constitutional disturbance; where however amputation was performed with complete success, and life has at all events been prolonged for many years. I relate this case in order to shew that our knowledge of the subject is hitherto imperfect, and as a caution against concluding hastily that a disease is malignant, and the patient's situation consequently hopeless.

CASE.

A tumour appeared spontaneously, and increased rather rapidly in the left thigh of a gentleman twenty-seven years of age. He consulted one of the most eminent surgeons in London, who said that the limb must be removed. The patient accordingly took lodgings in town, and a day was fixed for the operation. When the surgeon came, he was alarmed by the local and general symptoms, and determined not to proceed until a consultation should have been held on the case. The four most experienced and celebrated surgical practitioners of the period, were unanimous in considering the affection malignant, and that an operation would not be justifiable. The patient returned to his residence in the country in

* Surgical Observations on Tumours, page 52.

the situation of a man condemned to death. Anxious however to take any chance of escaping, however slight, he determined, on the suggestion of a medical friend in his neighbourhood, to take the opinions of Sir W. Blizard and myself, before he abandoned himself to his fate; and we visited him together. We found him with a tumour of elastic feel, undefined in its circumference, about four inches in diameter, with the skin shining and bright red, on the anterior and inner part of the left thigh, a little above the knee. There was a firm indolent swelling, about as large as a hen's egg, imbedded in the soft parts, at the back of the pelvis, and a similar one in the back, near the spine; one as large as a nut over the left eye, and several smaller ones just under the skin in various parts. All the smaller productions had shewn themselves subsequently to the appearance of the large tumour in the thigh. The patient was almost worn out by pain and want of rest; he was excessively emaciated, with profuse fetid perspiration. I considered the case quite hopeless, not only from the multiplication of the external swellings, but also from the probability that disease had occurred in internal organs. To Sir W. Blizard it appeared in a light rather less unfavourable; he thought there was a chance of success from amputation, and he performed the operation two days afterwards (March, 1819). This was half a year after the first appearance of the swelling. The more serious and distressing symptoms were immediately relieved, and the patient eventually recovered. The

tumour in the eye-brow, which had increased and become painful, was removed in 1825. In December, 1828, I was consulted by this gentleman on account of a tumour in the forearm as large as a walnut, situated over the course of the ulnar nerve, and causing severe pain with indescribable sensations, like electric shocks, upwards and downwards in the direction of that nerve. Mr. —— had enjoyed tolerable health, without being strong. At this time he was nervous and irritable, with an anxious countenance and an aged appearance. I removed the disease in February, 1829: it was situated between the flexor carpi ulnaris and the bone, and the nerve adhered so closely to it, that a portion was removed with the tumour. The latter was of firm texture, but not so hard as scirrhus. The part healed favourably, and remains well. Mr. —— again came to me in December, 1830, on account of a tumour, the size of a goose's egg, imbedded in the flesh of the stump. He had not been aware of its existence when the last operation was performed; and it had become troublesome only during the preceding six weeks. He now experienced most severe shooting pains in the part, with repeated recurrence of the electric dartings from the stump into the body. I removed the tumour, finding it necessary to make a large incision on account of its size and its deep situation. The growth, although it had been loose and felt circumscribed, appeared to be prolonged to the tuber ischii, and I removed it up to the bone. The part removed consisted of a circumscribed oval tumour, and of a

firm fibrous prolongation connected to it externally, and consisting of one of the flexors of the knee, which had been divided in the amputation, converted into a tough fibrous texture of light brown tint. The swelling was covered with a thin white capsule, and was homogeneous; in compactness, toughness, and colour it approached to the characters of scirrhus. The extensive wound of this operation healed without any unfavourable occurrence.

The pelvic and dorsal tumours remain nearly as they were twelve years ago. Several small subcutaneous knots can be felt in the arms and head, by passing the hand firmly over the surface; but they are less than when the thigh was amputated. There are a few small softish cutaneous growths in the face. The appetite, health, and strength are tolerably good; but there is of late increase of suffering. Strange sensations, sudden dartings and shootings occasioning convulsive movements, and compared to the effects of electricity, are often experienced.

Another source of difficulty in deciding on the nature of tumours and the question of operation is found in the circumstance that productions of dissimilar character may be combined in one morbid growth. This may occur in swellings developed in the soft parts, and striking examples of it are sometimes seen in the tumours of bones. From the interior of these organs, more especially of the femur and tibia, there may be produced growths of the medullary kind, which

are decidedly malignant, or of the fibrous and osseous description, which are of an innocent character; or of a third kind, in which the two former are blended together. All these productions pass under the unmeaning and vague term of osteo-sarcoma, which it would be better to banish entirely from medical nomenclature. If we speak of fungus hæmatodes, melanosis and cancer of bone; of fibrous and osseous growths, &c., our description may be rendered clear and intelligible, and rational rules of treatment may be laid down.

In the following case a tumour of mixed character, such as I have alluded to above, grew from the interior of the tibia. The limb was amputated; and the result of the operation has been hitherto perfectly satisfactory both as regards the limb and the patient's health.

CASE.

Elizabeth Warner, aged thirty, who came from a miserable hovel at Finchley, was admitted into St. Bartholomew's Hospital on June 30, 1831. She had a swelling nearly as large as her head, occupying the front and sides of the left leg immediately below the knee, on which it had encroached so much as to render the joint nearly motionless. It rose on the front into smooth rounded masses, separated by slight depressions. The skin covering it was for the most part fixed, apparently from mere distension, but otherwise healthy. The superficial veins were enlarged

and numerous. In front of the head of the tibia, where the disease had been first noticed, the integuments were thin, glossy, and livid; and a shallow sloughy ulcerated excavation as large as a half-crown piece was presented. A slough had been produced by the application of caustic; when it separated, some clear yellow fluid escaped; afterwards blood had flowed occasionally, and once to the amount of a pint. The tumour was fixed to the tibia, and was generally, though not uniformly, firm. In some parts it was of bony hardness, while in others it was soft and elastic. Hence doubts were entertained whether the complaint was a bony growth or fungus hæmatodes. The glands in the groin were not enlarged. The tumour began to appear in December, 1828, after the patient had hurt the knee by a fall. It had gradually enlarged, without causing pain or any inconvenience, except weakness of the limb, which obliged her to use a crutch. During her pregnancy, in 1829, the disease remained stationary and quiet; but after her confinement in February, 1830, whilst suckling, which she continued fourteen months, the tumour became much larger, and was occasionally very painful. The patient had usually enjoyed good health. Her mind had lately been rendered uneasy by the occurrence of bleeding, and she had lost flesh. She was, however, in a very favourable condition for undergoing an operation.

The thigh was amputated on the 2d of July. A large quantity of blood was lost during the operation,

the bleeding vessels being unusually numerous. No unfavourable symptom occurred subsequently. On the 29th of July the ligatures had all come away; and on the 11th of August the stump was perfectly healed, and the patient dismissed cheerful and well from the hospital.

Examination of the tumour. When the integuments and other soft parts had been removed, the tumour was found to arise from and be inseparably connected with the upper part of the tibia; or, it might be said that the bone, in its upper six inches, was expanded into the morbid growth, as there was a continuity of bony substance between it and the surface of the latter. When the diseased mass and the tibia had been divided by a vertical section carried from before backwards, it was found that the former had originated in the centre of the tibia; that it consisted partly of a tough fibrous texture, with bone plentifully deposited in it, partly of a medullary (cerebriform) substance; and that it contained numerous cells, of which the largest were from one to two inches in diameter. These cells, of which the surface was quite smooth, were filled with a transparent yellow fluid of watery consistence: in some of them there was also a small portion of coagulated blood adhering to the surface.

Nearly the whole exterior of the swelling, which had been considered to be bony from its hardness, the greater part of the septa between the cells, and the

surfaces of the latter were made up of the fibrous and osseous texture. The medullary substance, which was whitish, soft, and breaking down into a pulp under slight pressure of the finger, formed the nucleus of the tumour, where it grew out of the bone, and was also deposited partially between the cells.

One of the two halves, into which the mass had been divided, was subjected to maceration. When the soft texture had been completely decayed by putrefaction and removed, it appeared that the upper five or six inches of the tibia had been destroyed by the morbid growth, which had not penetrated the joint, the articular surface being entire though reduced to a thin shell. The latter was connected to the lower portion of the tibia by a net-work of bony fibres and plates, forming the skeleton of the tumour, and supplying the place of the bony shaft. There was an exterior thin and imperfect shell growing out of the walls of the bone below, and from the edge of the articular surface above. This was the bony substance, which had been felt on the surface of the swelling before the operation. The interior of the space circumscribed by this covering was irregularly traversed by bony productions shooting from the lower end of the tibia, and connected at various points both with the outer shell and with the remnant of the articular surface.

In the cases, which I have seen, of simply medullary or cerebriform growths originating in bones, the

progress of the disorder has been much more rapid than in the instance just related; the origin and increase of the morbid production have been attended with pain, generally considerable, and occasionally very severe, with interruption of rest, and more or less disturbance of the circulation and digestive organs. The following case, which I relate in illustration of the differences just mentioned, is interesting in other points of view. I may add that in a man, twenty-two years of age, whose thigh was amputated in St. Bartholomew's Hospital last summer by Mr. Earle, on account of a large medullary tumour growing from the femur, five months only had elapsed from the commencement of the disease, which had been attended with great pain, impaired health and loss of flesh.

CASE.

I was consulted on the 21st of February, 1825, by Mr. K., twenty-two years of age, and about six feet high, with large limbs, light hair, and fair complexion; the latter however having a rather pallid and doughy appearance. He had been quite well at the preceding Christmas, and two or three days after had felt a pain in the knee. He had been told that this was rheumatic, and would probably go away by exercise: he accordingly attempted to dance it off in the beginning of January, but found himself worse for the effort. He repaired, however, to Cambridge to prosecute his studies: the pain increased, and a

slight fulness was observed below the knee. When I saw him in February, there was no defined tumour, but an inconsiderable general swelling with a little redness, more particularly about the head of the tibia. The motions of the joint were unimpaired; but exercise brought on pain, which went off by rest. Leeches, aperients, and repose of the affected part were directed; and Mr. K. went back to the University. He returned to London much worse on the 4th of March. Pulsation had been felt in the swelling, and had led to the suspicion that it might be aneurismal. There was now an elastic tumour between the bones and below the knee, with general enlargement in the same situation, and slight œdema below. No beating could be felt in the swelling; but the pulsation of both tibial arteries was suppressed, although it was readily and plainly perceived in the opposite limb. The pulse was accelerated and the tongue foul; there was loss of appetite and costiveness; and the patient got very little rest at night. Two surgeons of great experience, who saw him, were doubtful about the nature of the complaint, but pronounced positively that the swelling contained fluid. It increased rapidly, the whole upper part of the leg being enlarged, with a considerable protrusion under the knee. When this part began to project more decidedly, the pulsation of the tibial arteries in the lower part of the limb returned. As the local complaint advanced, the constitutional disturbance increased, in spite of every effort to lessen it. The anterior prominence was now so soft as to make us believe that suppuration had

occurred; this opinion being corroborated by the increased pain and redness of the part. Under this impression, after the propriety of the measure had been considered in consultation, it was punctured deeply on the 2d of April, but nothing flowed except a little blood. It was now clear that the disease was a growth of medullary character, and that amputation, although its result was considered doubtful, afforded the only chance of saving life. A small bleeding fungus slowly protruded from the opening of the puncture. There had been lately slight enlargement of the inguinal glands without pain.

After the amputation, which was performed a week or ten days subsequently to the puncture, the case went on most favourably till the night of the 6th day. Mr. K. had been very well, and in excellent spirits: he went off quietly to sleep, and in the night rang for the nurse, who lifting the sheet, saw a most violent rush of blood from the wound; the patient died without uttering a word.

Examination of the limb and body. The head of the tibia was largely excavated by a medullary tumour of soft brainlike consistence, in which there were small deposits of coagulated blood. This growth extended forwards and backwards, being irregularly deposited between the muscles and in the intervals of their fibres. It had protruded from the bone just at the division of the popliteal artery, and the passage of the anterior tibial through the interosseous ligament.

This circumstance accounts for the pulsation felt in the tumour at an early period; for the suppression of the pulse in the tibial arteries, when the morbid growth was confined by the fascia of the leg; and for its subsequent return, when the progress of the swelling through the fascia had liberated the arteries from pressure.

An absorbent gland, situated close to the artery and cut through in the operation, was diseased.

The end of the femoral artery was completely open, without any trace of coagulum or effused lymph. The ligature, with its knot entire, was found in the stump.

The inguinal glands were diseased: they presented, when cut through, a marbled appearance from intermixture of white medullary matter with the natural texture of the gland. One or two glands on the side of the pelvis were diseased in the same manner.

There was a soft medullary tubercle, as large as a gooseberry, in the thin edge of the liver.

On the treatment of serous cysts. The essential differences that we observe, in the structure of cysts, and the nature of their contents, would lead us to suppose that the same principles of treatment cannot be applicable to all cases of encysted tumours. In

some instances the cyst is like the thinnest serous membrane, and contains a clear fluid of watery consistence; in others it is a fibrous structure more or less compact and thick, perhaps with a cuticular or horny lining, or with portions of cartilaginous or osseous texture, and containing either a thick fluid, or from that to the most compact kind of fat or other matter. The fibrous cysts must be either left alone, or completely removed by the knife. To irritate them, either by seton, by stimulating injections, or by incision and escharotics, is not only ineffectual as a means of cure, but very dangerous. Measures of the latter kind may be adopted without much risk in the serous cysts. We may make an incision into the swelling and keep it open; inflammation and suppuration of the membrane will ensue, and will lead to permanent obliteration of the cyst. Excision is applicable to the fibrous cysts, which are generally seated in the subcutaneous stratum of adipous texture; while the other mode of proceeding is more convenient in those of serous structure, which are seated more deeply, in the intermuscular cellular tissue, and generally covered, at least in part, by some superficial muscle. These, when neglected, often become so extensive, and are so closely connected to blood-vessels and other important parts, that complete excision would be either extremely difficult or impracticable. To illustrate the progress and character of the complaint, and the effect of the treatment, I shall relate two cases, in one of which the cyst contained a watery fluid, in the other hydatids.

CASE.

Large serous cyst in the neck treated by incision.

A youth, between thirteen and fourteen years of age, has had a swelling in the left side of the neck for eight years, during which time it has slowly increased, without pain or any interruption of health. Leeches, lotions, and other topical means have been employed without any apparent effect on the tumour, which is nearly as large as the fist. It is situated under the sterno-mastoideus; extending from the sternal end of the clavicle to the ear; passing in front to the side of the trachea, larynx, and œsophagus; and stretching behind the muscle towards the ligamentum nuchæ. It is soft and compressible throughout, obviously containing fluid; for its sides can be pinched together between the finger and thumb. It varies in tension according to the state of the surrounding muscles, but it is not affected by holding the breath or coughing.

On the 17th of September, 1830, I performed the following operation. An incision, between two and three inches long, was made over that part of the swelling which extended behind the sterno-mastoideus. After dividing the platysma myoides, a thin cyst was exposed and laid bare as far as the external incision would admit. It was then punctured, when a few ounces of light-brownish watery fluid escaped. I proceeded to cut out the denuded portion of the cyst, and found that it had a smooth surface, like

that of a serous membrane, and that in its substance there were other smaller cysts. Most of these communicated with the general cavity; but some were entire. The cavity presented a smooth surface, with a few inequalities, being lined throughout by a continuation of the membrane described above. It extended behind the sterno-clavicular articulation, and thence to the angle of the jaw and ear. The sterno-mastoideus and platysma myoides bounded it externally; the trachea, œsophagus, and large blood vessels on the inside. The carotid artery was felt through the thin membrane of the cyst, in the whole length of the neck, as if it had been dissected. I introduced four slips of lint, spread with spermaceti cerate, into the cavity, leaving their ends out at the wound, which was lightly covered with a similar dressing.

19th. There was some feverishness yesterday; slight delirium was observed in the night; to-day there is pain of the head with heat of skin. Twelve ounces of blood were taken from the arm at ten in the morning; it was buffed; the venesection was repeated in the evening.

21st. There has been copious thin discharge tinged with blood; the dressings were removed and renewed in the same manner. From this time they were renewed daily, the discharge gradually acquiring a healthy purulent character. In the middle of the third week a severe attack of inflammation, with

swelling and great pain of the neck, took place. There was some pain of the chest, with uneasiness in breathing, which was performed with a kind of catch; and some difficulty in swallowing. Leeches and poultice were employed, and no dressing was introduced into the cyst after this period.

20th of October. The frequent repetition of aperients and low diet have been necessary to check the disposition to inflammation. The wound is healing; a director passes in for about an inch and a half. The cavity was obliterated at the beginning of November, when the patient left town, though the wound had not completely cicatrised. A hard lump as large as a filberd could be felt in front of the sterno-mastoideus.

I have heard very recently that this young gentleman continues perfectly well, without any vestige of the former disease in the neck; that a peculiar carriage of the head, caused by the presence of the swelling, had disappeared; and that he is much improved in appearance and strength.

Since the foregoing case was under my care, I have found two interesting examples of similar affection recorded in the second volume of the Chirurgie Clinique de Montpelier of Professor Delpech, by whom they were successfully treated. In the first of these, a woman of twenty-four, in whom the complaint had begun at the age of nineteen, the swelling was as

large as the head, and occupied the front and sides of the neck. Professor D. punctured it, and let out more than four pints of "sérosité citrine, un peu visqueuse, mais très coulante." In twelve days the tumour had regained its original size, when he opened it by an incision two inches in length. After the contents had been cleared out, it was found that the back of the cyst was spread over the larynx and pharynx, passing on each side to the vertebral column; that it had displaced laterally the large blood-vessels and the sterno-mastoid muscles; that the two sides of the cyst nearly met together behind; that it covered the base of the lower jaw above, being continued below, in front of the trachea, a short way behind the sternum, and then reflected over the anterior surface of the bone at its upper part. The cyst was filled with packets of charpie tied up, it being considered important to place these foreign substances in contact with all points of the internal surface, in order to excite an uniform degree of inflammation throughout. Fresh packets of charpie were added daily, in proportion as room was left by the subsidence of those previously introduced. Every five days the whole quantity was taken out and replaced by a fresh supply. The wound was perfectly healed on the ninetieth day*.

The other case was that of a boy twelve years old, in whom the swelling, as large as the head of a child

* Chirurgie Clinique, Tom. II. p. 79—87.

at birth, had commenced in early infancy, was situated under the sterno-mastoideus, and extended from the neighbourhood of the ear to the clavicle. Two pints of yellow serous fluid were evacuated by a puncture, which was enlarged to an incision of two inches. The same course was pursued as in the former case, and the patient was quite well in forty days *.

Case of cyst in the orbit, containing hydatids, and causing protrusion of the globe, with eversion of the lower lid.

Charles Rowell, forty-two years of age, was admitted, under my care, into the London Ophthalmic Infirmary on the 3d of January, 1820, with protrusion of the globe from the orbit by a deep seated tumour, which had been growing for seven years. He had applied at the infirmary in an earlier period of the affection, when the unnatural prominence of the eyeball was distinctly marked, but vision had not become impaired. I could then feel obscurely, under the superciliary arch, a small firm protuberance, which seemed to be part of a deeply seated swelling, and considered that extirpation of this growth by an operation afforded the only chance of relief. The patient was averse to this measure, which was not strongly recommended, and he discontinued his attendance. The complaint had slowly increased, its

* Chirurgie Clinique, Tom. II. p. 88—91.

progress having been attended with great pain, which for some months had been so severe both day and night, as to cause great emaciation and general weakness.

When this patient was admitted into the infirmary, the tumour had advanced so far between the upper and inner portion of the eyeball and the eyelid as to have thrust the globe completely out of the orbit. The upper lid, greatly stretched and inflamed, covered the eye and the tumour; the lower was completely everted, and its membranous lining appeared as a thick fleshy mass. The conjunctival covering of the globe was thickened by chronic inflammation, the consequence of exposure. The structure of the eye was uninjured: the pupil round, and about in the middle state; the iris motionless. Vision was destroyed. The tumour was firm, and apparently fixed to the orbit: it afforded, on pressure, an obscure sense of fluctuation.

To relieve the distension and pain, and acquire some further insight into the nature of the disease, a puncture was made into the most prominent part of the swelling, and about a dessert spoonful of clear watery fluid escaped. Considerable diminution of suffering ensued. When I examined the part two days afterwards, I found a soft opake white substance in the puncture, and proceeded to remove it with a pair of forceps; it proved to be an hydatid, and a few others escaped when pressure was made

on the swelling. Some more came away on the following day, and I afterwards cleared out the whole collection, amounting to half a tea-cup full, by enlarging the puncture and injecting water forcibly into the sac. The hydatids varied in size, from that of a filberd to that of a small pea; some were entire, others collapsed. Inflammation and suppuration of the cyst followed without much pain; the discharge then gradually diminished, and the opening closed in about a month. The eye returned to its natural situation, and all uneasiness ceased. In March, the only traces of the complaint were a loose and wrinkled state of the integuments of the upper lid, and the eversion of the lower, which was gradually diminishing by the application of lunar caustic to the thickened conjunctiva. A little motion of the iris and slight perception of light had returned.

In the work already quoted, Professor Delpech relates two cases of serous cyst in the orbit; one of which contained a clear serous fluid *, the other a single large hydatid †. He made a free opening in each instance, and introduced charpie into the cavity. The latter proceeding seems to me objectionable in all cases of this kind, as likely to excite and keep up serious inflammation. That the objects we have in view can be accomplished without it, is obvious from the two instances I have related.

* P. 92. † Ibid. p. 99.

SOME ACCOUNT OF A CASE

IN WHICH

THE LEFT FEMUR

AND

THE FIFTH RIB ON THE RIGHT SIDE

WERE FRACTURED IN CONSEQUENCE OF DISEASE,

THE BLADDER BEING AT THE SAME TIME IN THE STATE OF CARCINOMATOUS ULCERATION,

WITH OBSERVATIONS,

BY SAMUEL COOPER,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON; SURGEON TO THE BLOOMSBURY DISPENSARY, ETC.

READ NOVEMBER 22ND, 1831.

On the 10th of November, 1831, I was desired by Mr. Blair, a surgeon in Great Russell Street, Bloomsbury, to visit C. Askey, aged 63, a gentleman's coachman in Montague Mews, Russell Square, who had been for several months afflicted with severe pain in the left hip, pelvis, and loins; continual uneasiness in the glans penis; and frequent inclination to make water, which came away with difficulty, and sometimes blended with a considerable quantity of blood.

About half an hour before I saw the patient, a loud snap was suddenly heard by his wife and

daughter in one of his limbs, as he was turning himself in bed, and he was immediately seized with excruciating pain in the left thigh. On taking hold of the limb, I distinctly felt a crepitus not far below the trochanters; the limb was retracted; and it was manifest, that the broken part of the bone was surrounded by a swelling, characterized by a remarkable degree of hardness.

Long sufferings and frequent returns of profuse hemorrhage from the bladder, had already reduced the patient to extreme emaciation and debility. The pulse was 130, irregular, and feeble; and the appetite entirely gone. Under these circumstances, conjoined as they plainly were with some organic disease of the bladder or kidneys, I applied splints to the broken femur, without any expectation of amendment of the health, or cure of the fracture. That the bleeding, and disturbance of the urinary organs, were not produced by a calculus in the bladder, was certain, because the quantity of blood in the urine was too copious to proceed from such a cause; the hemorrhage and pain had never been increased by exercise, nor even by the employment of driving a carriage; and, excepting at periods, when blood came away, the urine was perfectly clear. The sound had also been introduced into the bladder several times, without detecting any calculus in it. After I had attended the patient a few days, the bleeding ceased, and the urine became natural and transparent; but a profuse hemorrhage commenced

again on Sunday, November 20th, and he expired at ten o'clock the same night.

On opening the abdomen, a particularly hard mass presented itself on the fundus of the bladder, directly behind the os pubis—so hard, that the gentleman, who first examined it with his fingers, supposed it to be a calculus. This indurated substance was found to constitute the base of a considerable fungus, situated upon the inner surface of this part of the bladder, and exceeding a crown piece in diameter. It was from this fungus, that the copious bleedings had taken place from time to time during the last five months of the patient's life.

When the chest was examined, the fifth rib on the right side was found to have given way near its central part, the ends of the broken portion being at the same time involved in a scirrhous substance, which had quite as indurated a feel as the hardest kind of cartilage.

The femur was surrounded at its broken part, and also for some extent above and below the fracture, with a mass of the same kind of morbid tissue already specified, which here formed a thick protuberance, increasing very much the deformity, noticed about the hip directly after the occurrence of the fracture. The consistence of this tumour was rather softer towards the bone, than more superficially, and from that part of it, which lay near the fracture, a reddish brown thick fluid oozed out. The greater portion of

it, however, was peculiarly firm, and thickly interspersed with innumerable fragments of osseous matter.

As the patient had never complained of pain in the situation of the diseased and fractured rib, the discovery of such mischief was completely unexpected.

The bladder contained about six ounces of turbid brown urine, and nearly as much coagulated blood.

All the absorbent glands, in the neighbourhood of the abdominal aorta, were enlarged, (some of them to the size of a pigeon's egg,) and converted into the same kind of scirrhous substance, observed around the fractured bones.

I have the honour to lay before the Society the diseased parts; namely, the broken femur with the indurated and partly bony mass by which it was surrounded; the fractured rib with the hard morbid substance around it; the bladder with the ulcerated, scirrhous, and fungous state of a portion of its fundus; and a diseased absorbent gland, taken from the vicinity of the lumbar vertebræ for the purpose of exhibiting the change of structure, which all the others, in front of the spine, had undergone as high as the diaphragm.

The kidneys were healthy, but the ureters were much distended with urine, and their coats thinned, so that, in this condition, they looked exactly like

two very transparent glass tubes, filled with a yellowish fluid, and about half an inch in diameter.

The examination of the body was made by Mr. William Miller, of Great Russell Street, in the presence of Dr. R. Pinckard, Mr. Skey, Mr. G. Cooper, and myself.

Some differences of opinion may exist about what name ought to be given to the tumour connected with the femur: the disease could not be regarded as fungus hæmatodes or medullary sarcoma, the hardness of the morbid tissue being too great, and the general intermixture of osseous matter with it constituting perhaps another difference*. Besides, if it had been of this nature, the disease of the bladder would doubtless have been of a corresponding character;

* In the conversation, which followed the reading of this case to the Society, Mr. Langstaff mentioned his belief, that bony deposits are not uncommon in fungus hæmatodes. This is a point, which may require further inquiry; for, amongst numerous examples of this disease, reported by Hey, Wardrop, Sir C. Bell, and Mr. Langstaff himself, I find only one instance of the occurrence, and that merely in one place and in a trivial degree. I ought to notice, however, that the fungous exostosis of the medullary membrane, described by Sir Astley Cooper, and sometimes considered to be of the same nature as fungus hæmatodes, is often interspersed with bony matter; and we frequently meet with ossific deposits, formed *in the vicinity of*, and *around* various kinds of tumours, which grow near bones. These last are different from the general intermixture of osseous matter with the substance of the diseased mass, as illustrated in the case here related.

but this was not the case, for though the ulcerated, fungous state of the inside of the fundus of that organ was of long standing, it did not form a large projecting mass, as happened in some other well authenticated examples of fungus hæmatodes of the bladder, and especially in that published by my friend Mr. Langstaff in the VIIIth volume of the Transactions of this Society, p. 279. Neither were the fungous granulations connected with any soft, pulpy, medullary mass; but situated upon a particularly hard substance, which constituted their base. According to my views, this affection of the bladder must be deemed cancerous; and if this inference be correct, may we not conclude that the tumour which grew round the femur, and led to its fracture, was of a similar nature; for it can hardly be doubted that the various forms of disease in this patient had a common origin from some peculiarity of constitution with which they were essentially united? The fact of the absorbent glands in front of the spine, from the pelvis to the diaphragm, being all in a completely scirrhous state, seems to corroborate these observations.

The indurated mass, surrounding the broken femur, was not continued from the medullary texture, nor in any way directly connected with it. Yet, this texture, when a longitudinal section was made of the bone, was found altered from its natural appearance, even as high up as the cancelli of the head of the femur, and also to the extent of two inches below the fracture. Throughout all this track, it was much

paler, than the healthy continuation of it lower down, and filled with pus. The boundary line, between the healthy and diseased portions of the medullary texture, is still completely manifest in the preparations now in my possession.

Great Russell Street, Bloomsbury Square,
November 22d, 1831.

HISTORY

AND

DISSECTION OF A CASE,

IN WHICH THERE HAD BEEN

DISLOCATION OF THE ANKLE

WITH

FRACTURE OF THE FIBULA.

BY W. LAWRENCE, ESQ., F.R.S.,
PRESIDENT OF THE SOCIETY.

READ NOVEMBER 22ND, 1831.

On the 17th of February, 1831, I was desired to see at Bethlem John Simon Steitz, a German, about forty years of age, who had been admitted as a lunatic on that day. He was lame in the left leg in consequence of a fall, which the persons who brought him from a private lunatic establishment represented to have occurred three or four weeks previously. I found him dressed and moving about lamely on the affected limb. The case was dislocation of the ankle with fracture of the fibula. The sole of the foot was turned outwards; the outside of the leg was bent inwards just above the ankle, where the fibula had been broken; and the lower end of the tibia, having lost its proper bearing on the astragalus, formed a large unnatural projection on the inside of the ankle. There was great and obvious deformity of the leg at its lower part, of the ankle and foot, which were red

and considerably swelled. The patient said that he did not feel, and had not felt, any considerable pain; that no treatment had been employed; and that he had gone about as usual since the accident, but with lameness. Having used considerable force without being able to replace the foot in its proper position, I directed the application of leeches and other means calculated to reduce the swelling. On the following day I succeeded in reducing the dislocation, after which the bandages and splints necessary for confining the foot and broken bone were applied. The patient was kept in bed, and was confined by the right arm and leg, as he frequently loosened and displaced the splints. On those occasions the projection of the tibia was renewed; but the eversion of the sole did not recur. He experienced no uneasiness, and constantly said that he could walk about very well if he were allowed to get up. He was however confined to the recumbent position for six weeks, and not allowed to bear on the foot for a fortnight longer. At the end of another fortnight he had regained the use of the limb so completely, that he needed no support, and could walk without any perceptible lameness. He seemed equally strong on both legs. The sole of the left foot rested flat on the ground; but there was a considerable prominence on the inside of the ankle from unnatural projection of the tibia at its lower end.

J. S. Steitz recovered sufficiently from his mental disorder to be discharged from Bethlem in June:

he was brought back to the hospital in August, being then in a state of most furious mania, which continued till the beginning of November, when he sunk completely exhausted.

Examination of the foot.—The tibia had partially lost its bearing on the astragalus. The outer half only of its inferior articular surface rested on the latter bone; the inner portion, with the malleolus internus, formed the unnatural prominence on the inside of the ankle. The fibula had been broken just above the external malleolus, and the fracture had been consolidated by a large formation of bony matter, which had made its lower extremity nearly equal in size to that of the tibia, and had anchylosed it to the latter bone. The superior extremity of the fibular fracture must have rested in the first instance on the outer half of the superior articular surface of the astragalus, and must have rubbed over it in its recently fractured and rough state, as long as the patient continued to use the joint. The asperities however had disappeared, and the consolidated fracture had become covered by a tolerably smooth cartilaginous layer continuous with the articular surfaces of the tibia and of the external malleolus.

The superior convex surface of the astragalus was partially flattened; and the cartilaginous covering was rubbed off it on the outside, where the broken end of the fibula had come in contact

with it. The bony substance thus denuded was however smooth.

The internal lateral ligament was greatly thickened, and formed a hard fibro-cartilaginous mass, in which some bony matter was deposited. Its attachment to the tibia was nearly as thick as the end of the thumb, and extended to that part of the inferior surface of the bone which projected over the inner edge of the astragalus.

The ligaments connecting the external malleolus to the foot were unaltered.

The anterior articular convexity of the astragalus was partially raised out of the corresponding cavity of the os naviculare, apparently from the former bone having been subjected to unusual pressure on the back and outer part of its upper surface, in consequence of the altered bearing of the leg.

The nearly complete recovery of the joint after so serious an injury must be considered an unexpectedly fortunate occurrence, when there had been not only a complete neglect of treatment, but also continued exertion of the injured part for three or four weeks.

In consequence of the partial separation of the tibia from the astragalus, the weight of the body must have been transmitted to the latter bone partly by the fibula, of which the broken end rested upon it.

The copious deposition of new bone, by which the fracture was consolidated and anchylosed to the tibia, gave to the part in question the additional strength which it required under these altered circumstances. The great thickening of the internal lateral ligament was an analogous provision on the opposite side of the joint against that eversion of the sole which might have been expected after such a dislocation.

CASE

OF

POLYPUS OF THE UTERUS,

BY G. LANGSTAFF, ESQ.

READ JANUARY 10TH, 1832.

Mrs. ———, 59 years of age, who had borne several children, and had enjoyed good health during the greater part of her life, and had ceased to menstruate several years, became affected with uterine pains, accompanied with frequent hæmorrhage, nearly twelve months previous to her death.

Six months prior to her dissolution the uterine hæmorrhage became so profuse as to affect her health; she was troubled with a cough and difficulty in breathing: the liver occasionally became disordered, and her countenance denoted symptoms of jaundice.

Several distinguished physicians and accoucheurs had been consulted; but it was only a few days previous to the death of the patient that the real nature of the disease was discovered, by her having submitted to an examination per vaginam; when it was found

that there was a polypus in the uterus projecting into the vagina.

She was advised to have the diseased growth removed by ligature, to which she consented; but she died from the effects of hæmorrhage, on the fourth day after seeing the gentlemen who had proposed the operation.

I was requested to inspect the body, and the following are the appearances which presented.

She had not become much emaciated; there was a considerable quantity of adipose substance seen on cutting through the parietes of the abdomen. In each side of the chest there was nearly a quart of water, and the lungs were partly filled with serous infiltration. There were about two ounces of fluid in the pericardium. The heart was very small, its structure flaccid, and the cavities and valves healthy.

All the abdominal viscera appeared blanched, and there was scarcely any blood in the vena cava; but there were evident signs of peritoneal inflammation, particularly in the situation where it is reflected over the pelvic viscera; and there were about two pints of fluid in the pelvis.

The liver was small and of a very pale colour; its structure so extremely soft as to be easily lacerated

by the pressure of the thumb and fore-finger. The gall-bladder and biliary ducts were greatly distended with bile. The spleen was small and very soft. The kidneys were healthy.

The omentum was laden with fat, and there was a firm union of a part of its extremity to the fundus uteri; and there were old standing adhesions of the posterior part of the serous covering of this viscus to the anterior surface of the intestinum rectum.

The pelvic viscera were removed for more minute examination.

The body of the uterus and its parietes were much larger than natural, yet there were not any signs of carcinoma or fungus hæmatodes.

A polypus had formed at the superior part of the fundus of the uterus, which seemed to have had its origin in the muscular coat; it had projected into the mucous surface, and proceeded along the cavity in the form of a large pedicle, nearly equal in size to its base, and the growth had passed through the os uteri into the vagina, where it had acquired the magnitude of a large peach, and assumed the appearance of a fungoid tumour.

The mucous surface of the tumour in the vagina had been destroyed by ulcerative absorption; it was coated with coagulated blood, which appearance in-

duced me to suppose that the hæmorrhage had proceeded principally from this part, and not from the vessels belonging to the internal surface of the uterus.

The os uteri was considerably dilated, so that there would not have been much difficulty in applying a ligature round the polypus.

The fallopian tube on the right side was completely obliterated, and the ovarium converted into small serous cysts, not hydatids.

The left fallopian tube was pervious; the ovarium was soft in texture, and there was an appearance exactly resembling what I have seen in a recent corpus luteum; but this event could not perhaps have been effected at such an advanced period of life; yet we have experiments to prove that excitement may produce appearances in the ovaria of rabbits and other animals, where there had merely been the exciting stimulus, at a proper period, without sexual intercourse; and I have, in my museum, some preparations of false conceptions which shew all the signs of the involucra of an ovum in the human being, without there being a vestige of an embryon, where actual intercourse had not been effected.

On cutting through the whole extent of the polypus, I found the cervix of a dense structure, exactly similar to that of the uterus; but to my asto-

nishment, when the incision was extended through that part of it which had entered the vagina, I found in its centre grumous blood contained in a dense cyst, surrounded by coagulated blood.

This appearance I have never before witnessed. Fluid has occasionally been found in the centre of large polypi. The polypus in this instance was small. I have seen them of various sizes; sometimes occupying the whole of the vagina. They frequently vary in structure, but are generally, I believe, denominated polypi. The application of a ligature will often succeed in preventing a recurrence of the disease; but I think that in the present instance the operation would, considering the patient's state of health, have proved unsuccessful.

ON SOME MORBID APPEARANCES OF THE ABSORBENT GLANDS AND SPLEEN.

BY DR. HODGKIN.

PRESENTED BY DR. R. LEE.

READ JANUARY 10TH AND 24TH, 1832.

The morbid alterations of structure which I am about to describe are probably familiar to many practical morbid anatomists, since they can scarcely have failed to have fallen under their observation in the course of cadaveric inspection. They have not, as far as I am aware, been made the subject of special attention, on which account I am induced to bring forward a few cases in which they have occurred to myself, trusting that I shall at least escape severe or general censure, even though a sentence or two should be produced from some existing work, couched in such concise but expressive language, as to render needless the longer details with which I shall trespass on the time of my hearers.

CASE I.

November 2, 1826. Joseph Sinnott, a child of about nine years of age, in Lazarus's ward, under the care of J. Morgan. His brother, his constant companion with whom he had habitually slept, died of phthisis a few months previously; he was much reduced by an illness of about nine months, during which time he had been subject to pain in the back, extending round to the abdomen. On his admission his belly was much distended with ascites. He had also effusion into the prepuce and scrotum. On the latter was a large ulcer induced by a puncture made to evacuate the fluid.

Head.—There was a considerable quantity of serous effusion under the arachnoid and within the ventricles. There were a few opake spots in the arachnoid, but this membrane was in other respects healthy. The pia mater appeared remarkably thin and free from vessels. The substance of the brain was generally soft and flabby, but no local morbid change was observable.

Chest.—The pleura on the right side had contracted many strong and old adhesions, in addition to which there were extensive marks of recent pleuritis. On the left the pleura was nearly or quite free from adhesion, but there was some fluid effused into

the cavity. There was some little trace of a tubercular cicatrix at the summit of the right lung, but the substance of both lungs was generally light and crepitant, with a very few exceedingly small tubercles scattered through them.

The mucous membrane exhibited an excess of vascularity; the bronchial glands were greatly enlarged and much indurated.

The heart appeared quite healthy.

Abdomen.—There was extensive recent inflammation of the peritoneum, in the cavity of which there was a copious sero-purulent effusion, and the viscera were universally overlayed with a very soft light yellow coagulum, too feeble to effect their union, though evidently having a tendency to do so. The mucous membrane of the stomach and intestines was generally pale and of its ordinary appearance, but in some few spots it was softened and readily separated itself from the subjacent coat. The contents of the intestines were copious and of an unhealthy character, overcharged with bile. The mesenteric glands were generally enlarged, but one or two very considerably so, equalling in size a pigeon's egg, of semi-cartilaginous hardness and streaked with black matter. The substance of the liver was generally natural, but contained a few tubercles somewhat larger than peas, white, semi-cartilaginous, and of an uneven surface. The

pancreas was firmer than usual, more particularly at its head, which was somewhat enlarged. The spleen was large and contained numerous tubercles. The absorbent glands about both the two last-mentioned organs were much enlarged. Both kidneys were mottled with a light colour, but were free from induration. A continuous chain of much enlarged indurated absorbent glands of a light colour accompanied the aorta throughout its course, closely adherent to the bodies of the vertebræ, and extended along the sides of the iliac vessels as far as they could be traced in the pelvis. None of these vessels had been sufficiently compressed to occasion the coagulation of the contained fluids. The coats of the thoracic duct, which was large, were perfectly transparent and healthy.

CASE II.

September 24, 1828. Ellenborough King, aged ten years, was admitted into Luke's ward on the 6th of August, 1828, under the care of Dr. Bright. He was the youngest of six children, of whom the first five were reported to be all healthy. This child had also been healthy till about thirteen months ago, when his strength, flesh, and healthy appearance began to fail. He was at that time living in the west of England. A tumour was observed in the left hypochondrium in the situation of the spleen, the glandulæ concatenatæ on the right side were observed to be considerably enlarged, but under the treatment employed,

these tumours, as well as that in the situation of the spleen, were at times very considerably reduced in size.

It does not appear that he was ever subject to hæmorrhage, nor till very lately to dropsical effusion; his appetite was generally good. After his admission into the hospital the tumour on the left side was observed to extend considerably below the left hypochondrium, but was reported not to be so large as it had formerly been. The glands on the left side of the neck were swollen, as well as those on the right, the abdomen was somewhat distended, and there was considerable œdema of the scrotum.

The head was not opened.

The glands in the neck had assumed the form of large smooth ovoid masses, connected together merely by loose cellular membrane and minute vessels: when cut into they exhibited a firm cartilaginous structure of a light colour and very feeble vascularity, but with no appearance of softening or suppuration. Glands similarly affected accompanied the vessels into the chest, where the bronchial and mediastinal glands were in the same state and greatly enlarged. There were some old pleuritic adhesions. The substance of the lungs was generally healthy. There was a good deal of clear serum in the pericardium, but this membrane, as well as the heart, was quite healthy.

In the peritoneal cavity there was a considerable

quantity of clear straw-coloured serum mixed with extensive, recent thin diaphanous films. The mucous membrane of the stomach and intestines was tolerably healthy.

The mesenteric glands were but slightly enlarged, and but little if at all indurated; but those accompanying the aorta, the splenic artery, and the iliacs were in the same state as the glands of the neck.

The liver contained no tubercles, and its structure was quite healthy. The pancreas was rather firm, and the glands situated along its upper edge, were, as before stated, greatly enlarged. The spleen was enlarged to at least four times its natural size, its surface was mammillated, and its structure thickly sprinkled with tubercles, presenting the same structure as the enlarged glands already described.

CASE III.

BY H. PEACOCK, ESQ.

November 28, 1829. William Burrows, aged about thirty years. He was admitted into Naaman's ward on the 26th of September, 1829, under Mr. J. Morgan, for ulcers of a scrofulous character in the axilla and neck, accompanied with general cachexia; he had previously been a patient in Samaritan's ward with secondary symptoms of syphilis,

and was supposed to have taken large quantities of mercury.

About four months before his death, which occurred on the 27th of November, abdominal dropsy made its appearance.

The body was extremely emaciated, some ragged excavated ulcers were situated about the right axilla and thorax; the ulceration extended beneath the neighbouring skin, and between the pectoral muscles. The muscles of the body were pale.

The head was not examined.

The left cavity of the chest contained about a pint of serum. The lung was rather œdematous, but otherwise healthy, with the exception of some puckering and apparently chalky deposit at its apex. The lung on the right side adhered closely to the walls of the cavity, the adhesions being firm and cellular. The lung resembled that of the left side, and was also slightly disorganized at its apex. The pericardium contained about an ounce of clear and straw-coloured fluid. The heart was small and flabby.

The abdomen contained about two pints of clear serum. The stomach and alimentary canal were much distended with flatus. The liver was of a shrunken irregular shape, and was connected to the

diaphragm by a few firm adhesions. Its structure was indurated, pale, and thickly pervaded with a substance having a white, hard, tuberculous character which in some parts had the form of defined rounded masses of the size of large pin heads, but for the most part was diffused. Some sections exhibited parts apparently stained with a dark ecchymosis as if from extravasated blood.

From some portions of liver seen after the inspection by Dr. Hodgkin, it appeared to him that the liver was in that state in which the acini became dense, rounded, and of a light colour, resembling small tubercles, and are readily detached: a condition of liver which is almost peculiar to those who have laboured under a cachectic condition from mercury. The gall-bladder was small and filled with a dark coloured green bile. The pancreas was not diseased. The spleen had contracted several firm adhesions to the neighbouring peritoneum; it was enlarged to about twice its usual size, and was unusually firm. Sections exhibited its structure dense, rather dry, and of a dark red colour, but homogeneous. Dr. Hodgkin examined this spleen, a short time after its removal from the body, and found its substance generally pervaded by numerous minute translucent bodies somewhat resembling incipient miliary tubercles of the lung, but considerably smaller than these generally are.

The kidneys were pale, flabby, and slightly mottled.

A few small miliary tubercles were found in the peritoneum, about the inguinal region resembling those which have been noticed above in the liver. Some of the mesenteric glands were much enlarged and filled with a firm white deposit. The inguinal, lumbar, and aortic glands were similarly affected. The bronchial glands were in a similar state, and also extensively ossified (or loaded with earthy matter). The axillary glands were in a state of suppuration, and exposed by ulceration at the part. The thoracic duct presented nothing unusual.

CASE IV.

January 8, 1830. Thomas Westcott, aged apparently about fifty years, by trade a carpenter, a patient of Dr. Addison in the Clinical Ward, admitted 30th of December, 1829. He was not at all wasted, but was rather plump than otherwise; he had a pale and peculiar, cachectic countenance, which, without minute description, may be suggested to the mind by comparing it to what is seen in some cases of confirmed disease of the spleen. The most remarkable feature in his case was the great enlargement of nearly, if not quite, all of the absorbent glands within reach of examination, but more especially in the axillæ and groins. Those at the side of the neck were scarcely less so. Most of these glands which were within reach, were of about the size of pigeon's eggs, a few somewhat larger, and others rather smaller. They were of a smooth

rounded or ovoid figure, and were only moderately firm, rather than indurated. An enlargement was also to be felt in one epididymis. The abdomen was distended, but the substance of the parietes appeared thick, no distinct tumour could be felt in the region of the spleen, or in any other part of the abdomen.

The functions of the brain had been somewhat disturbed, and the left eye did not see so well as the right.

It did not appear that this patient had been liable to any particular exposure, nor could any circumstance be referred to as the exciting cause of his malady. His death took place very suddenly in the morning of the 8th, and the examination was made four hours and a half after.

The veins of the head and neck were turgid. There was no lividity of the face. There were some ecchymosed spots on one of the legs.

The arachnoid was remarkably thick and opake. On the surface of the right hemisphere there was a diffused light rose-red colour, occupying the space of about the size of a crown piece; it appeared to depend on infiltration of the pia mater. This membrane separated readily from the surface of the brain. No morbid appearance was discovered in the substance of the brain, and no undue quantity of fluid

in the ventricles. The cerebellum seemed to be, proportionately, rather small.

The right optic nerve was rather smaller than its fellow.

The glands in the axillæ and neck, as might have been expected, were found prodigiously enlarged, the deepest seated being in general the largest. The cellular structure around these was loose and free from any morbid deposit. These glands were smooth and of a whitish colour externally, with a few small bloody spots. When cut into, their internal structure was likewise seen to be of a light, nearly white, colour with a few small interspersed vessels. They were of a soft consistence, which might be compared to that of a testicle. They possessed a slight translucence, and were nearly or quite uniform throughout, exhibiting no trace of partial softening or suppuration. Although in appearance and consistence these enlarged glands bore considerable resemblance to some fungoid tumours, they presented nothing of the encysted formation. The alteration in this case seemed to consist in an interstitial deposit from a morbid hypertrophy of the glandular structure itself, rather than on a new or adventitious growth. The glands in the groin presented precisely the same character as those just described; the same may also be said of those in the thorax and abdomen, the situation and extent of which will be presently stated.

The pleuræ were nearly, if not altogether, free from adhesions and effusion. There were a few ecchymosed spots on the posterior part of the right lung; both lungs were spongy and crepitant, but rather emphysematous, and of a light colour, from the small quantity of blood which they contained.

The bronchial tubes contained some thick mucus.

The pericardium was healthy. The heart was greatly enlarged, and the right cavities particularly dilated; but the left were also large and distended, with thickened parietes. The muscular structure however did not appear to be diseased. The blood in the heart was barely coagulated, resembling that recently drawn into a basin. The glands along the subclavian arteries and about the roots of the bronchi were much enlarged.

In the abdomen nothing particular was noticed about the peritoneum. The glands at the small curvature of the stomach, several in Glisson's capsule, and a large mass of them along the entire course of the abdominal aorta and iliac arteries were greatly enlarged. There was a marked difference in the mesenteric glands, which, though larger than is natural, were none of them of the prodigious size of those above mentioned; they were however of a light colour, and their increase of size evidently depended on an interstitial deposit similar to that of the other glands. One of the enlarged glands

in the lumbar region had a good deal of superficial ecchymosis. The absorbent vessels connected with it were enlarged and distended with a bloody serum. A similar fluid less deeply tinged was found in the thoracic duct.

The liver was very large, pale, and slightly granular. The spleen was very greatly enlarged, being at least nine inches long, five broad, and proportionally thick; its colour was lighter and redder than is natural, and more firm and close. On cutting into it an almost infinite number of small white nearly opake spots were seen pervading its substance; they were of irregular figure, but a few appeared nearly circular. They appeared to depend on a deposit in the cellular structure of the organ. There were no tubercles in the spleen, but the spots just mentioned were perhaps a commencement of this kind of formation.

The pancreas was large and pale, but otherwise healthy. The mucous membrane of the stomach and bowels offered nothing remarkable.

CASE V.

Inspection of a middle aged man, who had latterly been a patient of Dr. Back. He had long been in bad health, and had been for some time a patient under Dr. Bright. His last most urgent symptoms were referrible to the chest. When in the hospital

the former time, he was observed to have the glands of the neck, and more particularly those near the upper part of the thyroid cartilage, considerably enlarged.

The body was emaciated. The glands before mentioned were still much enlarged, those in the axillæ were not observed to be particularly so, those in the groins were somewhat so. The abdomen was distended.

The head was not examined.

The greater part of one lung was distended, solid and void of air, its texture was rather soft and readily lacerable. Its colour seemed to be the result of the acute white hepatization very deeply soiled with reddish brown. The other lung was far from healthy, but it was rather engorged and softened than hepatized, and still contained air. One, if not both, pleuræ exhibited traces of recent inflammation with little or no effusion.

Nothing remarkable is remembered to have been noticed in the heart or pericardium.

In the abdomen there was a large quantity of serum with little appearance of coagulable lymph. In the stomach the mucous membrane was not quite healthy, presenting some indications of chronic inflammation; it, as well as the intestines, contained

unhealthy secretions. The liver was of remarkably large size, weighing upwards of seven pounds. Its form and the smoothness of its surface were little if at all altered. The colour was somewhat mottled with a mixture of darkish green and yellow. The acini were manifestly enlarged, and it was suspected that they had undergone the fatty degeneration; but on exposure to heat, it appeared to contain little, if any, greasy substance. The spleen was very large, its weight is not known, but it appeared to be four or five times the average size; its texture was rather more solid and compact than is natural; it contained no tubercles, but the cellular structure interspersed through the parenchyma was more conspicuous than is usual, in some parts appearing in the form of specks, in which it was soft and easily broken down. The absorbent glands accompanying the aorta were greatly enlarged, some equalling at least the size of a pullet's egg; some, but more especially those in the abdomen, were reddened by injected or ecchymosed blood. The receptaculum chyli and some of the larger lymphatic branches, contained blood mixed with dark and almost black coagula. The thoracic duct, which was large, was filled in the same manner.

CASE VI.

July 19, 1830. Thomas Black, aged about fifty years, admitted into Barnabas Ward on the 30th of June, 1830, under the care of Dr. Bright. He was affected with large tuberose swellings of considerable

firmness on both sides of the neck, in both axillæ, and in both groins. His abdomen was greatly distended, he suffered from difficulty of breathing, and was pale and rather emaciated.

It appeared that, about two years before, he had laboured under fever. That, being exposed to cold, shortly after, he observed the glands swell on one side of the neck; not long after on the other side, and in succession, those in the situations above mentioned.

The body presented considerable lividity, especially the extremities on the left side. The left side of the neck, and the left axilla, presented the largest tumours.

The head was not examined.

The tumours evidently depended on greatly enlarged absorbent glands along the course of the carotid and axillary arteries. On raising the sternum they were found to extend along the subclavians and internal mammaries; they were also found, though in less number and size, along the aorta in the posterior mediastinum; but it did not appear that the bronchial glands were at all similarly affected. There was some appearance of recent pleuritis and serous effusion into the chest.

In the peritoneal cavity there was a large quantity

of yellow serum mixed with some flakes of lymph. A large and continued mass of nodulous glandular tumours surrounded the aorta and iliac arteries, but the mesenteric glands were very slightly affected. The omentum was corrugated. The liver was rather small, with an irregular and uneven surface, its colour was lighter than natural, and the acini were converted into rounded fleshy masses, without any very great change in the intervening cellular membrane. It also contained two or three white tubercles, which resembled fungoid tubercles of the liver, and were situated at the surface of the organ. The structure dependent on cysts was not demonstrable in them, but from their form it might be suspected. The spleen was of moderate size, and appeared to be quite free from any adventitious deposit, which is a fact worthy of remark, as in very many cases of glandular disease bearing resemblance to the present case, this organ has been affected, and generally tubercular. The pancreas was imbedded in the tumours, but appeared pretty healthy.

The kidneys were livid and congested.

The tumours which formed the most striking features in this case very nearly resembled each other in structure; there appeared to be merely a little difference in firmness; they were of various sizes, from that of a horse-bean to that of a hen's egg; they had a round or ovoid figure, and were invested by a thin membrane, pretty smooth externally, and

connected to the loose and apparently healthy cellular membrane which surrounded the tumours; the other surface intimately adhered to the structure of the tumour. This texture was apparently pretty uniform throughout, and was pale and slightly translucent, and could not be said to evince traces of the mode of formation dependent on cysts; they shewed no disposition to suppuration or softening; some, when just taken from the body, were of a semi-cartilaginous hardness, but became considerably softer after a little maceration.

The aorta appeared to be a little compressed by the tumours.

This patient had an old reducible hernia on the right side, on which side there appeared to be hydrocele also.

It may be observed that notwithstanding some differences in structure, to be noticed hereafter, all these cases agree in the remarkable enlargement of the absorbent glands accompanying the larger arteries; namely, the glandulæ concatenatæ in the neck, the axillary and inguinal glands, and those accompanying the aorta in the thorax and abdomen. That as far as could be ascertained from observation, or from what could be collected from the history of the cases, this enlargement of the glands appeared to be a primitive affection of those bodies, rather than the result of an irritation propagated to them from

some ulcerated surface or other inflamed texture through the medium of their inferent vessels, and that although, in some instances, the glands so enlarged may contain a little concrete inorganizable matter, such as is known to result from what is called scrofulous inflammation, it is obvious that this circumstance is not an essential character, but rather an accidental concomitant to the idiopathic interstitial enlargement of the absorbent glandular structure throughout the body. That unless the word inflammation be allowed to have a more indefinite and loose meaning than is generally assigned to it, this affection of the glands can scarcely be attributed to that cause, since they are unattended with pain, heat, and other ordinary symptoms of inflammation, and are not necessarily accompanied by any alteration in the cellular or other surrounding structures, and do not shew any disposition to go on to the production of pus or any other acknowledged product of inflammation except where, as in the cases above alluded to, inflammation may have supervened as an accidental affection of the hypertrophied structure. Nor can the enlargement in question, with any better reason, be attributed to the formation of any of those adventitious structures, the production of which I have already had occasion to describe, and have referred to the type of compound adventitious serous cysts. Notwithstanding the different characters which this enlargement may present, it appears nearly in all cases to consist of a pretty uniform texture throughout, and this rather to be the consequence of a general increase of every

part of the gland, than of a new structure developed within it, and pushing the original structure aside, as when ordinary tuberculous matter is deposited in these bodies. At the same time it must be admitted that the new material by which the enlargement is effected, presents various degrees of organizability, which in some instances is extremely slight, and appears incompetent to maintain the vitality of the affected gland. In such cases the new structure will generally become opake, soften, or break down, and acting as a foreign irritating body, excite irritation and lead to the formation of abscess. The case of William Burrows, (No. III.,) and also that of a native of Owhyhee, who died in Guy's Hospital with extensive abscess in the axilla, are, I believe, to be considered of this kind.

The remarkable appearance of blood in the thoracic duct and some of the absorbents, observed in the case of Thomas Westcott, (No. IV.,) although it sufficiently attracted my attention to induce me to have a drawing immediately made, was only regarded as an accidental occurrence ; but the recurrence of the same phenomenon to a much more considerable and striking extent in the recent case, (No. V.,) induces me to suppose that it is intimately connected with this glandular disease. It may also be observed that in the last-mentioned case the enlarged glands from which the lymphatic vessels containing blood proceeded, were particularly loaded with blood ; and if my recollection does not deceive me, a tendency to

the same state was present in the case of Westcott, although it escaped notice in the record of the inspection.

Another circumstance which has arrested my attention, in conjunction with this affection of the absorbent glands, is the state of the spleen which, with one exception in all the cases that I have had the opportunity of examining, has been found more or less diseased, and in some thickly pervaded with defined bodies of various sizes, in structure resembling that of the diseased glands. We might, from this circumstance, be induced to suspect that these bodies in the spleen, like the enlarged glands themselves, are the result of the morbid enlargement of a pre-existing structure, an idea which may derive some support from the fact, that although in human spleens no glandular structure is distinguishable, in those of some inferior animals a multitude of minute bodies exist which appear to be of that nature. Malpighi indeed considered the acini or granulations in the spleen to be glands. In one instance it may be remarked that although the glandular derangement had advanced very far, the depositions in the spleen were extremely minute, assuming the appearance of miliary tubercles. Hence, we may conclude that if, as I conceive to be the case, there be a close connection between the derangement of the glands and that of the spleen, the latter is a posterior effect, and on this account may not always have been produced, when that of the glands or some other disease

carried off the patient. In other instances, the spleen, although much enlarged, contained no regular defined bodies, although the white cellular structure was very evident in increased quantity pervading the dense and enlarged mass of the organ. In such cases it might still be doubted whether, had the patient's life been protracted, the deposits in question might not ultimately have taken place, yet I am inclined to believe the contrary, and to suspect that either the previous derangement of the structure of the organ or the greater age of the patients may have opposed their production. I mention this effect of age merely as a suspicion or idea, founded on the fact that I have very rarely, if ever, met with any kind of tubercles, excepting those of malignant character, in the spleens of adults, whilst they have been by no means unfrequent in a far less number of spleens of children and young persons which it has fallen to my lot to examine. The only exceptions which I can call to mind, as having been furnished by my own observation, have been in the case of one or two foreigners from warm countries, on whom the change of climate may have had considerable effect.

Some further confirmation of my suspicion that a connection exists between the glandular derangement of which I have been speaking, and the state of the spleen, has occurred to me since the preceding observations were written. Whilst examining the unrivalled collection of pathological drawings made by my friend Dr. Carswell, I was struck with one repre-

senting a greatly enlarged spleen, loaded with large tubercles of a rounded figure and light colour. I immediately recognized it as a fine example of the affection I have been describing, and my suspicions were presently confirmed by the doctor's shewing me another fine drawing of the greatly enlarged glands of the neck, axillæ, and groins of the same subject.

The Doctor has favoured me with a copy of the case, and allowed me to place the drawings themselves before you.

CASE VII.

" Cancer Cerebriformis of the Lymphatic Glands, and of the Spleen.

" The delineations of this very remarkable case were taken from a man who died in the hospital St. Louis at Paris, in the month of April. Monsr. Lugol, one of the physicians of the hospital, and under whose care the patient was, has promised to give me the particulars of this case. I was told, however, that the patient, who was between thirty and forty years of age, stout made, and not lean, had been affected with swelling of the glands under the jaws, along both sides of the neck, in the axillæ and groins for between three and four months, from which he had suffered but little inconvenience, to which he had paid but little attention, and had employed no remedies. It was only a short time before he applied to be taken into the hospital that he felt a

difficulty in swallowing, which rapidly increased, and for the last two or three days was such as to prevent him from taking any kind of food whatever. As his appetite had never been affected by the disease, he was, when he came to the St. Louis hospital, in a state of great suffering, not only from want of food and from debility, but from the idea that he was rendered incapable of satisfying the cravings of hunger, together with the prospect of inevitable death.

" He lived rather more than two days.

" *Inspection of the body.*—On each side of the neck were large groups of glands extending from the angle of the jaw down to the clavicle, where they were joined to another group, coming up from the axillæ and passing under the clavicle. The submaxillary and sublingual glands were greatly enlarged, and united with the other lymphatic glands, formed an almost continuous chain stretching along the border of the jaw, and uniting under the chin. These glands were of various sizes, some of them were not larger than a pea, while others were as large as a hen's egg; they were round, oval, or of an irregular form, particularly where they were united by a common capsule. A great many of them presented the colour which distinguishes them in the healthy state; others were of a yellowish tinge, with more or less redness and vascularity; whilst a few were of a deep red colour and highly vascular. The

greater number of them when pressed between the fingers, felt pretty firm and somewhat elastic; those that were red and vascular were softer. All of them were enclosed in a thin but firm capsule, which contained a substance of the colour and consistence of brain, and in which were distributed a considerable number of blood-vessels. In the softest the vascularity was such as to give to the cerebriform matter an appearance resembling a mixture of equal parts of brain and blood. A similar state of the glands was observed in both groins. The greater number of them were as large as pigeons' eggs, and could be followed passing upwards under Poupart's ligament, surrounding the great blood-vessels, and terminating in the diseased lymphatic and mesenteric glands. The diseased appearances observed in the glands of the groin are represented in No. 4—6. Fig. I; those of the neck and axillæ No. 4. a. In No. 4—6 is seen the appearance of the substance of which the glands were formed; in one of them the vascularity of this substance is seen to be very great, whilst in the other the vessels are few in number, long, and slender. The quantity of cerebriform matter is also seen to differ considerably in each. Besides, in the lower figure the lobulated structure which it presents is pretty well marked. In Fig. III. two of the glands are represented after having been injected. In the upper one a large vein is seen coming out from it, and arising from a great number of minute vessels, which apparently are situated near the surface of the gland. In the lower one, the corresponding artery is shewn,

dividing and subdividing into an immense number of extremely fine branches which are distributed throughout the substance of the gland. No. 4. c. Fig. I. represents an enormous tumour formed by the lymphatic glands situated under the liver, duodenum, pancreas, and great blood-vessels of these parts. It was as large as an adult's head, projecting forwards on a level with the convex surface of the liver, and carried before it the duodenum, pancreas, and gall-ducts, which passed over its anterior surface. Fig. II. represents a section of this tumour, which is seen to be formed of a great number of glands, some of which are as large as a small orange. Like those of the neck and axillæ, they were composed of cerebriform matter, possessing a greater or less degree of vascularity. In the centre of the tumour considerable hemorrhage had taken place, the centre of the hemorrhagic effusion was occupied by coagulated blood, and the circumference by layers of fibrine. The vena cava and aorta passed through the tumour, and the former was nearly perforated by one of the diseased glands.

" No. 4. e. Represents the same pathological condition in the glands situated in the posterior fauces. The glands situated around the root of the tongue were so much enlarged as to shut up completely by their projecting upwards, backwards, and forwards, the posterior nares and superior aperture of the œsophagus. I could not ascertain the precise state of the epiglottis, but it must to a certain

extent at least have been free, as it did not appear that inspiration had been much impeded. The amygdalæ, formed entirely of cerebriform matter, presented a pale-yellow colour tinged here and there with red specks, produced apparently from the rupture of minute blood-vessels. They have also lost that characteristic appearance from which they derive their name, having become almost perfectly smooth from the accumulation of the cerebriform matter and the distention of their envelope.

"The spleen was the only organ apart from the lymphatic glands which presented a similar, or indeed any, disease in this remarkable case. The external surface of this organ is shewn in No. 4. a. Fig. I. Besides great increase of its bulk, it presented externally a great number of irregular elevations surrounded by redness and vascularity. When divided longitudinally, Fig. II., it appeared to be formed entirely of cerebriform matter and fine blood-vessels; hardly any trace of its natural structure being observable. It presented a lobulated structure; the lobules varying from the size of a small pea to that of a large gooseberry; these being again divided and subdivided into smaller ones—the boundaries of the lobules and the intersections of the latter were the parts in which vascularity was greatest—it did indeed appear as if the lobulated structure had been the result of a vascular net-work so disposed as to inclose and separate more or less completely portions of different sizes of the cerebriform matter. It

depended, however, in all likelihood, on the structure of the spleen, in the cells of which, or in the blood which they contain, the cerebriform matter was deposited or formed, whilst the blood-vessels which surrounded the lobules and ramified in their intersections arose from those which belong to the splenic cells.

"The body having been removed by inadvertence before I had time to examine the chest, I did not ascertain the state of the bronchial glands, but I was informed by one of the house-physicians that they were not diseased."

Although the Doctor has employed the term "cerebriform matter," which conveys a ready idea of the texture of the diseased glands, he will excuse my differing from him so far as to regard the affection in this case as distinct from cerebriform cancer. I feel the less difficulty in doing so, in the recollection that one of the cases of which I had given the details was, like Dr. Carswell's, considered as fungoid until a special and close inspection had detected the difference.

Besides the preceding cases, of which I have been enabled to obtain the inspections, I have met with other examples in the living subject which, as far as the glands were concerned, were evidently of the same character with those I have been describing. One of the most remarkable occurred in the person of a Jew, apparently between forty and fifty years of

age; the glands in the neck were prodigiously enlarged, forming smooth ovoid masses, unaccompanied by inflammatory symptoms or thickening of the surrounding cellular structure. The glands in the axillæ and groins were in the same state; in fact, in this case, the enlargement was more considerable than in any other that I have witnessed. His general health was much impaired; I do not recollect that there were any dropsical symptoms at the time I saw him. I accidentally lost sight of him, but afterwards learnt that he died about two months from the time of my seeing him.

Another case occurred in a cachectic, rather emaciated child, who was brought, on one occasion only, as an out-patient, to Guy's Hospital. The glands in the neck, axillæ, and groins were considerably enlarged, and as far as I could judge were of the firm character observed in the cases of Joseph Sinnott and Ellenborough King, rather than the softer and more fleshy character noticed in the glands of Westcott, Black, Case V, and as far as I could observe, in that of the Jew just mentioned.

A pathological paper may perhaps be thought of little value if unaccompanied by suggestions designed to assist in the treatment, either curative or palliative; on this head however I must confess that I have nothing to offer.

Most of the cases, it may be observed, were those

of patients in the hospital, where they had not sought admission until the disease had reached an advanced and hopeless stage. The Jew was the only individual whom I had an opportunity of treating myself, and him only for a short period, when his case had already become hopeless. The cascarilla and soda which were given with a view to improve his general health, and the iodine employed as the agent most likely to affect the glands, appeared to be productive of no advantage, on which account it is probable the patient withdrew himself from my observation. Were patients thus affected to come under my care in an earlier and less hopeless period of their malady, I think I should be inclined to endeavour as far as possible to increase the general vigour of the system, to enjoin, as far as consistent with this object, the utmost protection from the inclemencies and vicissitudes of the weather, to employ iodine externally, and to push the internal use of caustic potash as far as circumstances might render allowable. I mention this last part of the treatment in consequence of the strong commendation which Brandrish has bestowed on the use of this caustic alkali in absorbent glandular affections. The views which I have been induced to take respecting the functions of the absorbent vessels, would make me the more disposed to adopt it *.

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* Shortly after the reading of this paper, I was favoured with the following communication from my friend G. O. Heming, of Kentish Town:—

Having been led to notice some morbid appearances in the spleen connected with the glandular disease of which I have been speaking, I take the opportunity, before quitting this organ, to advert to another morbid appearance presented by it. In the observations prefixed to the sixth section of the second part of the catalogue of Guy's Museum*, I have briefly noticed a derangement of structure met with in the spleen, which arrested my attention, rather from con-

DEAR SIR,

You will, I am sure, be pleased with the following extract from Malpighi.

Yours truly, G. O. Heming.

"In homine difficilius emergunt (speaking of the granules in the spleen): si tamen ex morbo universum glandularum genus turgeat, manifestiores redduntur, auctâ ipsarum magnitudine, ut in defunctâ puellâ observavi, in quâ lien globulis conspicuis racematim dispersis totus scatebat."

* "The preparations from 2000 to 2004 inclusive, although of but little pathological importance, possess some interest as specimens of a morbid appearance occasionally met with in the spleen, but which, so far as the author knows, has not been hitherto described or noticed. It consists of a partial or circumscribed degeneration of the structure which becomes preternaturally firm and dense, and of a light colour. The part thus affected may be easily mistaken for a tubercle, until close inspection has detected in it traces of the original structure of the organ. It is bounded by a defined line, and on the surface there is sometimes a slight depression where it is united to the healthy structure. In all the instances which the author has yet observed, the portion of spleen thus degenerated has been situated in a transverse direction. He has observed it principally, if not exclusively, in males, and he is inclined to consider it as the result of external injury."—Vid. Catalogue of the Museum of Guy's Hospital. Part II. Sect. 6.

sidering it as hitherto undescribed, than from having reason to attach any importance to it in conjunction with disease. The cases which I have since met with have not only thrown further light on its nature, but have shewn that it may become the cause of violent and even fatal symptoms. The partial induration of the spleen accompanied with loss of colour, and in general with a diminution of bulk, and having at first sight a good deal of the appearance of tubercle, seems to be only one of the stages in which this derangement of the spleen presents itself to our view. It appears to commence in a partial extravasation of blood, the character of which will perhaps be best conceived by stating it to be what would be called by some pathologists apoplexy of the spleen. This I had already conceived to be the case, and suspected that it arose from external violence. The case of Mary Hamblin, No. I., tends to confirm this suspicion: it is however by no means improbable that spontaneous or idiopathic apoplexies of the spleen may take place. Yet the general appearance of the lesion will, I believe, form a characteristic distinction between such cases and those in which external violence had been the cause.

When the effusion of blood is quite recent, the part affected is distinguished from the other parts of the organ, not only by its increased density, but by its deep venous hue. It does not remain long in this state, but soon begins to assume a brownish colour,

the change generally taking place at the circumference, but sometimes at the centre. This change, the rationale of which is not easily given, is precisely similar to that which takes place in apoplexy of the lungs, in the transition of the red into one of the grey forms of induration of the lung from inflammation; in the coagula sometimes met with in the heart and vessels; in the layers of aneurismal tumours; and even in cerebral apoplexy.

The portion of spleen thus altered, although possessing little perceptible trace of organization, may yet retain its vitality, and remain a permanent structure, in which case its density increases, but its bulk contracts, and a thin semi-transparent boundary may be seen to separate the altered from the healthy structure of the organ; this I conceive to be occasioned by the former not participating in the constant variations of dimension to which the latter is liable. It was in this state that the derangement of which I am speaking first presented itself to my attention. (See 2d, 3d, and 4th Examples.)

Although, as I have remarked, the derangement in question, when arrived at this stage, may reamin quiescent for an indefinite length of time, and perhaps never throughout the life of the individual give rise to the slightest inconvenience; yet, it would seem to predispose the adjoining parts of the organ to derangement either from external force, or from unusual

distension. In the 5th Example, this disturbance appears to be extremely slight, only amounting to a slight appearance of extravasation or apoplexy.

In the sixth case, that of Maria Lowther, the derangement in the structure of the spleen, in the neighbourhood of the indurated portion, was much more considerable, amounting to complete softening, accompanied by softening in the central part of the degenerated spot. It appeared pretty evident that this state of the spleen was the exciting cause of the severe peritonitis, in the same way that this inflammation is not unfrequently set up by disease in the appendix cæci from feculent concretions. It is also highly probable that some of the remarkable symptoms which attended this case, and excited the idea of phlebitis, were also dependent on what may be considered as the gangrenous softening of the substance of the spleen in contact with the indurated part. No light was thrown on the cause which excited this softening, but if my suspicions are correct as to external injury being the cause of the original derangement, it is likely that a repetition of this cause, may promote the secondary affection by producing a slight laceration on the surface of the indurated part. Although the sudden death of the patient who formed the subject of the seventh case was rather to be attributed to the heart than to the state of the spleen, yet I think we must principally ascribe to this latter cause, the symptoms under which this girl had laboured, and more especially

those paroxysms which were regarded as occasioned by intermittent fever.

My enquiries in this case also did not succeed in leading to any information as to the mode in which the process of softening had been excited. It is possible that slight external violence may have been adequate to this effect. It may, however, be queried whether intermittent fever had not actually existed, in the cold stage of which the spleen being gorged may have sustained a partial laceration where its distension was restrained by the unyielding character of the previously degenerated portion. Be this as it may, there can be but little doubt that the occurrence of such paroxysms would either occasion such a disorganization, or greatly aggravate it when once set up.

No. I.

May 3, 1831. Mary Hamblin, a patient of Dr. Bright's, in Charity Ward, admitted April 27th, 1831, in consequence of a state of mania, in which she was reported to have been a little more than a week. She was the mother of twins, whom she had suckled sixteen months, and being a spare and delicate woman, had been greatly reduced thereby. For some time before her admission she had complained of uneasiness in her head, and said she was afraid she should go out of her mind, as her mother and some others of her relations had done. Only an imperfect

account could be obtained of her symptoms prior to admission, but it appeared probable that some restraint approaching to violence had been employed, since in a transient lucid interval which occurred whilst in the hospital, she expressed her satisfaction at not being likely to be again ill used. Whilst in the hospital she generally lay in a state of insensibility, almost amounting to coma, yet sometimes, in a state approaching to delirium, she would sing hymns, and try to get out of bed, but she was easily restrained. It did not appear that there was any erotic tendency in her delirium. She died six days after her admission.

Nothing remarkable was observed external to the dura mater. The vessels of the pia mater were less injected than is usual, more especially where forming the plexus choroides, which was nearly colourless. The arachnoid about the pons varolii was rather considerably but partially thickened. The substance of the brain offered nothing remarkable.

The pleuræ, lungs, pericardium, and heart were generally healthy.

The peritoneum appeared free from marks of either old or recent inflammation, and nothing remarkable was discovered in the mucous membrane of the alimentary canal.

The liver seemed healthy in form and texture, but

its convex surface was mottled with irregular spots and blotches of a yellowish colour, which suggested the idea that the organ had received some violence.

The spleen was of its natural size and generally of a healthy appearance, but it was irregularly mottled with spots of a deeper and darker venous hue, the central parts of some of which were of a lighter colour. Notwithstanding the irregularity of these spots, they imperfectly affected a transverse direction across the organ a little above its middle. On cutting into the spleen so as to pass through some of these spots, they were found to consist of portions of the substance of the spleen indurated by coagulated venous blood, like portions of lung in pulmonic apoplexy. Some of these masses were of a light colour internally, but with little or no softening. It seems highly probable, that these appearances in the liver and spleen, and which had in all probability nothing at all to do with the death of the patient, were the effects of some degree of injury produced by the means employed for restraint shortly after her attack.

The kidneys were not observed to offer any thing remarkable.

The uterus was of its natural size, but its lining membrane was of a deep red colour. The fallopian tubes were free from adhesions and appeared quite healthy. The ovaries were rather large, exhibited

few cicatrices, and were remarkably smooth for those of a married female of her age. They were rather flabby.

EXAMPLE II.

Extract from the report of the Case of Daniel Patrick.

In the spleen, which was rather large, there was an irregularly shaped but circumscribed mass, rather larger than a hazle nut, of a structure which at first appeared to be tuberculous, but which proved to be dependent on a peculiar alteration of structure.

EXAMPLE III.

Extract from the report of the Case of J. Woodbridge.

The spleen was of moderate size; a defined portion of its structure was considerably indented, having about the firmness of liver a little indurated, the part so altered was of a light brown colour, approaching to that of new leather; the passage from this to the healthy part was abrupt, but there was no membranous separation between them. This derangement of structure did not appear to be attended with either increase or diminution of volume, so as to produce either depression or protuberance at the surface, although this was partially implicated.

EXAMPLE IV.

Extract from the report of the Case of William Hunter.

The spleen was of a moderate size; it had contracted some peritoneal adhesions, there were a few small semi-cartilaginous spots on its surface, and a circumscribed portion had undergone a peculiar degeneration, by which its texture was rendered solid and of a light brown colour. As in the three former cases in which this derangement has been already noticed, it appeared, on the surface of the organ, where a slight depression existed between the healthy and altered structure. A vessel of considerable size was seen passing through this part, which still retained some faint traces of its original structure.

EXAMPLE V.

Extract from the report of James Skelton.

The spleen was of moderate size, it was in its contracted state, and its structure was generally healthy, but deeply imbedded in its convex surface, there was a light yellowish brown well defined deposit. About some portion of the surface of this deposit, there was a little extravasation of blood, apparently of an apoplectic character.

CASE VI.

October 24th, 1829. " Maria Lowther, aged 17 years, admitted into the Clinical Ward on the 22d

instant under the care of Dr. Bright. She had enjoyed but indifferent health for some time. About five weeks ago she suffered much from a whitlow on the forefinger, caused by the prick of a needle, her finger healed, but about a week after, she appeared to have a cold. She had cough, painful respiration, and frequent rigors, she complained of great pain in the bowels and head, particularly of the latter. An abscess now appeared under the axilla, but previously to its appearance she had suffered much from irritability; this abscess dispersed, but was immediately succeeded by another on the fore-arm, together with the reappearance of the one in the axilla. Her head at this period became more confused, she grew worse, and became delirious. Her legs were observed to be œdematous on the Monday or Tuesday previous to her admission, and general tenderness was complained of for the first time yesterday. For a week past her motions had appeared bloody, and epistaxis had taken place on two occasions. Soon after her admission she appeared in an exhausted state, her face pale and anxious, her eyes sunk, and there was exquisite tenderness to the touch throughout the body. The feet and legs were slightly œdematous, ecchymosed spots were formed on the hands and feet, there was an abscess in the axilla and another on the fore-arm. The abdomen was tumid as well as tender. At night the symptoms were aggravated, she became delirious during the night, and at the morning visit she was found in a dying state; death took place about half-past ten in the morning of the 23d."

The body was a little emaciated, the discolouration resembling purpura had almost entirely disappeared. The cuticle was raised both at the tip of the middle finger, and on one toe on the right side into two bullæ containing slightly purulent sanguinolent serum. The abscess in the axilla presented a cavity of about the size of a moderate orange, it was ragged internally, and of a dirty sanguinolent colour; one or more of the absorbent glands were nearly detached by the destruction of the surrounding cellular membrane.

Nothing remarkable was observed in the calvaria or membranes of the brain, except that the arachnoid was very transparent, and that there was rather an unusually small number of vessels visible in the pia mater. The substance of the brain was likewise healthy, except at the posterior part of the left hemisphere, where a portion of about an inch in diameter, occupying a part both of the cortical and medullary structure, was completely softened and broken down. It was slightly discoloured by blood imperfectly intermixed, it was not surrounded by any induration or distinct line of demarcation, but the softening was most considerable towards the centre.

Both pleuræ were healthy, with the exception of slight traces of recent inflammation at the lower part of the left lung. The substance of the lungs was likewise generally healthy, but at the posterior part of the left there were some traces of recent inflamma-

tion limited to a few lobules which were firmer and of a somewhat lighter colour than the surrounding structure, which was the seat of cadaveric infiltration. At the back part of the left lung there was some hepatization as well as cadaveric infiltration.

The pericardium was healthy, but contained about two ounces of straw coloured serum. There was a small opake white patch on the anterior surface of the heart. The organ itself was quite healthy, but contained a small quantity of blood which was imperfectly coagulated, except near the origin of the vessels where there was some coagulum prolonged into these vessels. A partial separation of the colouring matter had taken place.

The abdomen was somewhat distended, the peritoneum presented universal marks of inflammation, several convolutions of intestines were feebly glued together by tender and opake membranous flakes of lymph. There was considerable effusion of yellow colour mixed with flocculent particles of opake lymph, and presenting a sero-purulent character. The surface of the stomach in contact with the under surface of the liver was covered with a layer of yellow lymph. The peritoneal covering of the small intestines was easily detached from the muscular coat. The stomach and small intestines were distended with gas, their mucous membrane was generally healthy, but the patches of aggregate glands were rendered distinct by numerous minute blackish points. The

mucous membrane of the colon was of a darkish grey colour, and was extremely irregular, which appeared to depend on lymph and other secretions becoming adherent to a number of small thickly scattered points. On scraping off this secretion, the subjacent surface presented either a smaller spot of very slight abrasion or a livid ecchymosis. This state had probably been preceded by suppressed mucous secretion. The liver was of large size, extending over the spleen to the left side, and passing down for some distance between it and the parietes. It was rather pale, but in other respects healthy, except that it presented spots of ecchymosis where it had been in contact with the spleen.

The spleen was rather large, and presented the following remarkable appearances: two portions rather more than an inch in breadth, placed transversely and occupying the whole of the shorter diameter of the spleen, were of a lightish yellow colour, they were of closer structure than the natural texture, and appeared to depend on a particular degeneration of a part of the organ itself. A process of softening had broken down the central parts of these portions, which were situated about an inch and a half from each other. The substance of the spleen in contact with these portions was of a deep livid colour and completely softened.

The pancreas was healthy. The kidneys were likewise healthy. The ovaries were of an elongated

figure, full and plump, their surfaces presented numerous bright red points, their tunics white and dense, without any appearance of cicatrices. The vesicles of De Graaff generally clear and healthy, but a few, in one of the ovaries, were in the form of white opake semi-cartilaginous bodies. The intervening substance in both was pale, but unusually firm.

The uterus was small.

There was an equivocal appearance of a remaining hymen.

The symptoms in this case having induced a suspicion that the veins were inflamed, they were particularly examined in different parts of the body. No phlebitis was, however, discovered, yet in some of these vessels the blood was coagulated, and from its appearance had probably been in this state a short time before death.

CASE VII.

September 21st, 1828. Martha Newton, aged apparently about 25 years, a patient of Dr. Bright's, in Dorcas's ward, into which she was admitted on the 17th instant. She had come to town from Brighton, and described herself as labouring under intermittent fever, but her appearance did not altogether accord with the idea of ague. She stated that she had been taking bark prior to her coming to town, and a re-

petition of bark or sulphate of quinine was prescribed. Her pulse was not remarkable either for quickness or irregularity, and none of her complaints suggested a suspicion of disease of any of the viscera of the thorax. She had one paroxysm shortly after her admission, which was reported by the sister of the ward to differ from the ordinary paroxysm of ague. She was seen by Dr. Bright in another of these paroxysms on the 19th. The quinine or bark was continued, but some local visceral disease rather than ague was suspected. She died suddenly on the morning of the 20th, after eating a moderate breakfast.

The body was pale and not emaciated, and rather œdematous, the arcola round the nipple was but faintly discoloured. The abdomen bore no marks of parturition.

The head was carefully examined, but no morbid appearance was detected in the brain or its membranes, except some thickening, and a whitish deposit in very minute opake particles in the plexus choroides.

There was a great deal of old pleuritic adhesion on the right side, less on the left, and a small quantity of clear but discoloured serous effusion on both sides, infiltrating the adventitious cellular structure. Both lungs had more than the natural firmness, but not the character of hepatization. They were of a

darkish livid colour, very œdematous, contained very little air, and no tuberculous nor other deposit.

The pericardium contained two or three ounces of serum, which was very sanguinolent. This state of the serum, not only in the pericardium, but also, though in a less degree, in the pleura, was probably more the result of transudation after death than before it. There was a strong adhesion in the form of a ligamentous bridle between the close and the reflected pericardium on the left side. The pericardium on the auricle was roughened by minute elevations.

The heart appeared distended, and on being laid open by a transverse section it was found to be dilated, with thinning rather than hypertrophy of its parietes. The muscular structure was flabby and pale, and less evidently fibrous than in health. The right ventricle was nearly as much dilated as the left; no valvular disease was detected, but at the mouth of the pulmonary artery there was a singular original formation. There appeared to be four valves instead of three, a small part of one of them being cut off by a thin membranous partition.

The quantity of fluid in the abdomen was inconsiderable. There were no adhesions except in the neighbourhood of the spleen, where they were considerable, old and strong, especially between this organ and the diaphragm.

In the spleen there was a defined mass of about the size of a walnut of a light colour, which, as in some specimens before observed, appeared to depend on an infiltration into, or degeneration of the structure of the part. This mass appeared to be commencing the process of softening. The structure immediately adjoining it was, however, much more softened, so as nearly to have effected its separation, it was of a dark or almost black colour. The remainder of the spleen, though not similarly affected, was soft, probably from cadaveric change. There was, however, one part of its substance in which a change resembling the infiltration before mentioned was commencing.

The stomach contained scarcely any food, and with the intestines appeared to be tolerably healthy.

The liver and pancreas were likewise healthy.

The kidneys were pale, and in the right there was a yellowish white mass in which a degeneration similar to that noticed in the spleen appeared to have taken place, the traces of the original structure being still visible.

The ovaries presented several cicatrices, the tubes were free from adhesions. The uterus rather large. A vascular peritoneal cyst was attached to one of the broad ligaments.

HISTORY OF THE CASE

OF

A MAN

WHOSE

SPINE WAS FRACTURED.

WITH

THE DISSECTION.

BY W. R. BARLOW, ESQ.,

SURGEON, WRITTLE, ESSEX.

COMMUNICATED BY G. LANGSTAFF, ESQ.

READ DECEMBER 13TH, 1832.

CASE.

A MAN twenty-eight years of age, whilst wheeling a barrow filled with gravel, was knocked down by the sudden falling of a tree, which some men were hewing; it struck him on the back, and fractured his spine. He was immediately conveyed to Writtle workhouse, where I visited him soon after his admission, being the surgeon of the establishment.

I found him quite insensible, and he appeared almost lifeless. On examining the course of the spine I discovered an angular projection in the situation of the last dorsal and first lumbar vertebræ.

In a short time his powers rallied, but he was still faint and his legs were completely paralysed; a small quantity of brandy and water was given.

It seemed evident that the fractured parts were compressing the medulla spinalis, which induced me to attempt to place them in a more favourable position, by employing gradual extension. This was performed by persons pulling at the superior and inferior extremities, which had the desired effect; for the angular projection was greatly lessened, and the patient did not seem to experience any pain during the extension.

He was placed horizontally on a firm mattress.

The day after the accident he complained of much pain, and of a burning sensation in the situation of the injured part. Leeches were applied, and afterwards an evaporating lotion with opium, which afforded great relief. The bowels and vesica not having been relieved from the time of his admission into the workhouse, the urine was drawn off, and a brisk purgative given.

What appeared very singular in this case was, the absence of febrile action, and of the symptoms denoting inflammation of the theca vertebralis; yet the lower part of the body was paralysed, and deprived of sensation. The urine was drawn off twice a day;

his bowels were obstinately costive, and required active purgatives, such as croton oil, to relieve them.

In this miserable state he continued about eight months, when sensation began to appear in his thighs and legs, and with the assistance of a rope fixed to the upper part of the bedstead he managed to raise himself in the half-bent position without exciting the least sensation of pain in the spine.

Hopes were at this time entertained that the case would terminate favourably, notwithstanding the serious injury which the spine had sustained.

Although the sense of feeling in his inferior extremities improved, there still continued a want of power in the abdominal muscles and bladder. There was great difficulty in keeping his bowels open; but he would relieve the bladder by pressing with his hands firmly on the hypogastric region.

After twelve months' confinement in bed, he was able to bear the fatigue of being carried down stairs, and of being drawn about in a chair in the open air.

A few months from this period, he was attacked with a violent cold accompanied by fever, and was again confined to his bed; the integuments covering the left heel became inflamed, and sphacelation commenced. The febrile symptoms however subsided,

and the integumental parts which had been destroyed by sloughing, were gradually repaired.

But although he recovered from this attack, his health began to decline, pus was voided with the urine, his bodily powers gradually diminished, and the integuments covering the sacrum became gangrenous, although great care had been taken to prevent such an occurrence.

For fifteen days previous to his death he had suffered from incessant vomiting, and his stomach scarcely retained sufficient nutriment to support life.

Dissection.—The injured portion of the spine having been removed, and the soft parts dissected off, a longitudinal section of the vertebræ and intervertebral substances was made in order to show the changes which had been effected by the accident.

The theca vertebralis was thickened, and of a darkish-red colour; the medulla spinalis was greatly softened, and diminished in size near the fractured part of the spine.

The first lumbar vertebra had been fractured in a transverse direction, extending, obliquely downwards and forwards, through the upper third of its body.

The upper part of the vertebral column, together

with the upper fragment of the fractured vertebra, had been thrown forwards, the superior fragment resting on the fore and upper part of the inferior fragment, to which it was connected by callus.

The corresponding articular processes of the last dorsal and first lumbar vertebræ had been dislocated; those of the former having been thrown upwards and forwards. On the right side, the inferior articular process of the last dorsal vertebra was separated from the corresponding process of the first lumbar to the extent of the third of an inch, while their surfaces were rounded and nearly obliterated, in consequence of the length of time the patient had survived the accident. On the left side, the processes were about the same distance from each other, but connected by an intermediate portion of new bone.

The foramen between the roots of the spinous processes was more than twice its natural dimensions.

The ligamentum subflavum must have been ruptured.

The most important point in the change which was produced by the accident consisted in the altered dimensions of the vertebral canal: immediately behind the line of fracture it was diminished one-half in calibre, and it is probable that the medulla spinalis projected in some degree through the enlarged opening between the spinous processes.

The infundibula and pelves of the kidneys were dilated with urine mixed with pus; their internal surfaces were inflamed, as was the substance of the kidneys. There was a considerable quantity of urine and pus in the bladder, and its coats were thickened.

According to Sir Astley Cooper's observations, patients with fractured lumbar vertebræ die within a month or six weeks; but he knew of one patient who lived two years, and then died of gangrene of the nates.

In Mr. Samuel Cooper's Dictionary of Practical Surgery, in the description of fractures of the vertebræ, it is stated, that any attempt to set fractures of the bodies of the vertebræ, even were they known to exist, would be both useless and dangerous. In the case which I have described, it is evident that deviating from the general maxim, did not produce any bad effects.

ACCOUNT

OF

SOME EXPERIMENTS

ON

THE USE OF STYPTICS

IN

HÆMORRHAGE FROM ARTERIES.

BY CÆSAR HAWKINS, ESQ.,

SURGEON TO ST. GEORGE'S HOSPITAL, AND LECTURER ON SURGERY.

READ JANUARY 24TH, 1832.

It is probably well known to many members of the Society, that a series of experiments have been made to demonstrate the efficacy of a new styptic, discovered by MM. Talrich and Halmagrand, in controlling hæmorrhage, which, it is asserted, has been invariably successful in Paris, but which has been less uniformly effectual in this country; since, out of five experiments, three of which were made at St. George's Hospital, and two at the London Hospital, three have proved fatal, and in the other two the animals were killed before the time at which secondary hæmorrhage might have taken place had expired.

Most English surgeons, however, are acquainted

with the ingenious experiments published by Dr. Jones, in 1805, which prove how frequently natural means alone will check the hæmorrhage from the largest arteries, and which completely explain the mode by which this is effected. Dr. Jones minutely described the external and internal coagula, which are formed singly or in conjunction, and which are principally employed as a barrier against further hæmorrhage; he shewed also the manner in which *contraction* of the artery sometimes added to the security of the animal, and the circumstances under which *retraction* of the vessel at one time checked the hæmorrhage, and at another time increased it, according to the kind of wound made in the artery. Dr. Jones also explained the manner in which a wounded artery was sometimes obliterated after the operation, while at other times the permeability of the vessel remained, and the wound was completely cicatrized without interfering with the current of the blood.

When I saw all these circumstances described in the Bulletin Générale de Therapeutique Medicale et Chirurgicale, (Oct. 1831,) as if now for the first time discovered, and attributed solely to this new styptic, I could not but suspect some fallacy in the account, and that the styptic acted only a subordinate part in arresting the hæmorrhage, and I wished to show the pupils of St. George's Hospital, who had witnessed the supposed effect of the styptic in some experiments made by MM. Talrich and Halma-

grand, the real principles to which I believed those effects were to be ascribed, especially as many persons, who ought to have known better the principles by which hæmorrhage is controlled, appeared to have been deceived by witnessing these experiments. I did not hesitate therefore, without any previous trial, to make the following experiments in the presence of a considerable number of spectators, including MM. T. and H., in full confidence that *without their styptic* I could, in by far the majority of instances, succeed in controlling hæmorrhage as effectually as if it had been employed. And as the experiments were conducted in a different manner to those of Dr. Jones's, and prove something more than his have done, it may perhaps be interesting to record their result, as a further corroboration of the means by which hæmorrhage is prevented in wounds of arteries.

In most of Dr. Jones's experiments the free passage of the blood from the wounded artery was nearly, or completely, prevented by a continued suture in the skin, so that the blood necessarily forced its way into the cellular texture around, and there became coagulated; a method which he adopted from having found in some earlier experiments, that without this precaution the sudden loss of blood was generally fatal before the necessary clots could be formed. The mode in which, on the other hand, M. Halmagrand conducts his experiments is, to place three small tempons, or compresses of cotton dipped in his "Liquide

Hæmostatique", upon the wound of the artery, and retain them there for ten minutes with the fingers, after which a *single ligature* only through the skin is employed, which does not therefore close the wound, but merely prevents the compresses from being thrown out of the wound by muscular effort; a precaution which he has found necessary during the exertion of the animal to rise, and the omission of which occasioned fatal hæmorrhage in one of his experiments, at which I was present. This method I exactly imitated in the following experiments.

Experiment I.—I exposed the carotid artery of a sheep, and made in it a longitudinal wound about half an inch in length, and placed upon the orifice compresses of tow, of the same size as those which I had seen employed by M. Halmagrand, dipped in a decoction of *Aleppo galls*, (one ounce having been boiled for ten minutes in three-fourths of a pint of water,) and tied a single ligature in the skin before I withdrew my fingers from the wound. The animal was restless during the experiment, in consequence of which, perhaps, a small quantity of blood (about half an ounce) escaped when it rose from the ground, but none was lost subsequently. The compresses were taken away on the second day, and the sheep was killed on the tenth day by another experiment.

The wound in the artery was perfectly closed by lymph, without the formation of any coagulum in the vessel, which consequently remained pervious, the

cicatrix itself being hardly perceptible. Some coagulum had formed externally along the course of the artery, in the same manner as it had taken place in one of the sheep in which M. Halmagrand had made a longitudinal wound and afterwards applied his styptic, killing it however on the fifth day. (See preparation No. 1.)

Experiment II.—The same day M. Halmagrand laid bare the carotid artery of another sheep, so that the external wound might be such as he was accustomed to make. I then divided the artery transversely to exactly half its circumference, (a kind of wound which M. Breschet's experiments have proved to be more likely to bleed fatally than a transverse wound of either one-third or two-thirds of the artery.) The incision, however, had been made too much in front of the artery, so that M. H. had some difficulty in finding it, and the artery lay to the outside of my fingers instead of being directly below them; in consequence of which, before I could make any pressure on the vessel against the vertebræ, the animal had lost a pint and a half of blood and fainted. When it revived, a short time afterwards, the artery again began to bleed freely, so that the syncope had not allowed of coagulation, and the animal would probably have died if nothing further had been done. I then placed on the wound of the artery the usual compresses dipped in *Ruspini's styptic,* and held them for ten minutes, using a single ligature in the skin. No hæmorrhage occurred; the compresses were re-

moved at the same time as in the first sheep, and the animal was killed by another experiment on the eighth day.

There was some extravasation in the course of the vessel; the external wound, which was suppurating, communicated directly with the artery, which was completely blocked up by a firm coagulum, united by lymph to the interior of the vessel for about half an inch above and below the opening, connected on the side next to the heart with a loose coagulum two inches long. (See preparation No. 2.)

Experiment III.—I exposed the carotid artery of a sheep and cut out a circular portion of the vessel, a kind of wound which Dr. Jones had not tried, (probably because it is not one that is likely to occur in practice,) and placed over the opening the usual compresses dipped in *plain water only*. The animal was so restless however that I could not retain my fingers on the artery with sufficient firmness to prevent some escape of blood several times during its struggles, and after some time I removed the compresses, when as large a stream of blood issued as at first. I then placed some fresh compresses, dipped in water, on the opening in the artery, and retained them for ten minutes, though not without more struggling. The vessel still bled as soon as my pressure was relaxed, and consequently the animal was under the same circumstances, and would probably have died in the same way as another sheep in which M. Halma-

grand had made a similar, but somewhat smaller, wound, and had afterwards applied his styptic unsuccessfully. I therefore altered my experiment, and united the skin coarsely by a *continued suture*, so as nearly to confine the blood, in the same manner as Dr. Jones had done in his experiments. The integuments were distended with blood as soon as my fingers were removed, and some escaped also between the stitches, which were loosely fastened. The animal got up, however, in a short time without appearing at all faint, and there was no further hæmorrhage; it was killed on the sixth day, when the wound was open and suppurating freely. The interior of the vessel was completely filled with coagulum to a considerable distance above and below the wound, which was blocked up by a portion of the coagulum projecting into the aperture. (See preparation No. 3.)

Experiment IV.—I exposed the right carotid artery of the sheep, in which the left carotid had been opened in Experiment II., and removed a portion with scissors, and then placed on the wound three compresses of the usual size dipped in *plain water*, and made pressure with the fingers for ten minutes, and then put a single ligature through the skin. The animal lay quiet during the experiment, and not a drop of blood was lost till the next day, when considerable hæmorrhage occurred, and this continued at intervals till the third day when it died from the bleeding.

The wound of the soft parts was so small and di-

rect that no extravasation had taken place into the sheath of the vessel, and no external coagulum had formed, so that the wound of the vessel remained open. Within it a small recent coagulum only had formed, which nearly closed the end of the vessel nearest to the head, but left the lower orifice quite open. (See preparation No. 4.)

Dr. Jones found in his experiments, that a small wound leading directly down to an artery was more dangerous than one in which the soft parts around the vessel were more disturbed, as the formation of an external coagulum is facilitated by this interference with the cellular membrane. The sheep in this experiment was exposed to this source of danger, but it appeared to me, however, to have died not so much from this circumstance, since there was no hæmorrhage for twenty-four hours, as, in all probability, from its having disturbed the compresses in endeavouring to drink out of a high pail, for the water was found to be mixed with a large quantity of blood, while there was comparatively little elsewhere.

Experiment V.—I exposed the left carotid in the sheep which had been the subject of the first experiment, and placed a hook under the vessel. I then sewed up the wound in the skin coarsely by the continued suture, leaving room for the vessel to be drawn to the edge, and removed a portion of the vessel with the scissors to the extent of nearly half its circumference. The hook being withdrawn, so as to

allow the vessel to recede, the ligature was tightened so as nearly to prevent the exit of the blood, which came through the wound copiously for a few seconds, but then ceased. No further hæmorrhage occurred till the *third day*, when some recent blood was seen dropping from the wound; this continued at intervals till the fourth day, when the animal died.

The wound was much distended with coagulated blood, and suppuration was commencing; the opening in the artery was undefended by any plug, neither was there any coagulum in the interior of the artery sufficiently large to prevent hæmorrhage from either side. (See preparation No. 5.)

I should observe, that in all probability the last two experiments were performed under unfavourable circumstances, as the opposite carotid arteries had already been operated on, and in Experiment 4. the left carotid having been entirely obstructed by Experiment 2., only the vertebral arteries remained to convey blood to the head, so that probably the impulse through the right carotid became more powerful than it otherwise would have been; but, on the other hand, this very circumstance, which may have contributed to the unsuccessful result of Experiments 4. and 5., renders the success of Experiments 1. and 2. still more striking.

It appears, then, that in all these varied experiments, the flow of blood was restrained for a time,

the shortest period at which secondary hæmorrhage occurred having been twenty or twenty-four hours, and that in three of them the wound in the vessel was adequately closed to have prevented any further hæmorrhage. It appears, also, that out of *four* experiments performed in the same manner as M. Halmagrand's, but without the use of his styptic, *two*, viz., Experiments 1. and 2., were permanently successful, in one of them the artery being left pervious, in the other, being obliterated by coagulum; that a third, Experiment 3., failed at the time of the operation for want of sufficient coagulum in the vessel, to defend it after the compresses were loosened; and further, that Dr. Jones's method saved this animal after simple pressure had not succeeded; and that one only, viz. Experiment 4, was altogether unsuccessful, the animal having in this case only died of the operation.

The conclusions which I think may be legitimately drawn from these experiments, and from what I have seen of M. Halmagrand's, (and which are strengthened by the failure of the last two, since the reasons why they failed are plain,) are the following:

1st. Experiments 1., 2., and 4., demonstrate that pressure continued for ten minutes upon an injured artery, *in a nearly open wound* of the soft parts, by means of small compresses moistened in various liquids, may check the hæmorrhage from an artery in which a longitudinal or transverse wound has been

made, or from which a portion has been removed. They thus prove an additional point to the facts ascertained by Dr. Jones, whose experiments upon partially divided arteries were made in *wounds closed by a continued suture.*

2ndly. Experiments 3. and 5., shew that when a portion of an artery has been *altogether removed,* the hæmorrhage may be restrained, and the vessel permanently closed, by allowing the blood to coagulate in the soft parts, as in a diffused aneurism; Dr. Jones had previously proved this point with regard to several other kinds of wounds of arteries, but had not attempted this peculiar modification of injuries of vessels.

3rdly. Experiments 1., 2., and 4., prove that the means by which hæmorrhage is controlled, when pressure is made for a short time in an *open wound,* are the same which Dr. Jones's experiments had shewn to be exerted in a *closed wound;* viz., the formation of coagula, either in the lips of the wound of the vessel, or in the cavity of the artery, or in the cellular membrane around it, or in any two of these situations, or in all of them at once; except in some longitudinal wounds, which may occasionally be closed by the deposition of lymph alone, in which case the vessel may still remain pervious.

4thly. It is shewn further, that if coagulation takes place imperfectly, or if the clot is suddenly or violently disturbed, immediate hæmorrhage will occur.

In two of M. Halmagrand's experiments the compresses were probably thrown off thus by the exertions of the sheep, and the coagulum being consequently disturbed, both of them died. In Experiment 3., also, I could not obtain coagulation at all, the animal being so very restless on the table, and probably it would have died, had I not produced coagulation in a different way.

5thly. Experiments 4. and 5., shew that although the hæmorrhage may be controlled for a time, it may subsequently return at various periods from the causes pointed out in the last section as capable of producing immediate hæmorrhage. In Experiment 4. bleeding commenced about twenty or twenty-four hours after the injury, in Experiment 5. on the third day, and in one of M. Halmagrand's experiments at the London Hospital, described in the Medical Gazette, it did not occur till the fifth day after the wound. Dr. Jones's experiments also lead us to the same conclusion with regard to secondary hæmorrhage from wounded arteries.

6thly. It is probable that styptics applied to a bleeding artery can only be beneficial in two ways,—FIRST, by causing contraction of the coats of the bleeding artery. It is proved, however, by these experiments, as well as by Dr. Jones's and M. Halmagrand's, that whatever may be their effect upon *small* arteries, styptics scarcely induce any contraction of the coats of a *large* artery, and often none at all; but, that whatever may be the means employed to control the hæmorrhage, the formation of a clot, and the deposi-

tion of lymph, are almost always necessary. Surgical experience, moreover, teaches us the same lesson with regard to partially divided arteries, although, no doubt, in cases where an artery is wholly divided, contraction is powerfully exerted to prevent loss of blood. Or SECONDLY, styptics may be of service by accelerating or promoting the coagulation of the blood. If, for instance, the decoction of galls, which was employed in the first experiment, be mixed with recent blood, it instantly produces coagulation, and such, I am informed, is also the effect of MM. Talrich and Halmagrand's "Liquide Hæmostatique;" but Ruspini's styptic, which was permanently successful in the second experiment, and which is often employed in practice with marked benefit, produces no coagulation, nor any other sensible effect on recent blood; neither, of course, does plain water, which was temporarily successful in Experiment 4., promote coagulation. If, then, pressure for a few minutes upon a wounded artery can permanently prevent hæmorrhage, when that pressure is made with compresses dipped in various fluids, which neither produce contraction of the artery, nor facilitate coagulation, we are justified in concluding that if styptics *are* employed, the cessation of the hæmorrhage is to be ascribed principally, if not entirely, to the pressure, or at all events in a minor degree only to the action of the styptic.

7thly. These experiments further demonstrate that the effects of pressure with or without the use of styptics are precarious and uncertain, even in brutes, and therefore, *à fortiori*, ought not to be depended on

in cases of wounded arteries in man, to the exclusion of the almost uniform success of the ligature, whenever its employment is practicable. And, in fact, every day's experience teaches us, in the most striking manner, the important lesson, which these and all other experiments on the subject corroborate, that wherever there is an external wound communicating directly with a large artery, although 1st, there may be complete cicatrization of the wound, and consequently no further hæmorrhage; or 2dly, that a circumscribed false aneurism *may* be formed, (this may take place at least in man, though I am not aware that an aneurism has ever been formed in any experiments upon brutes,) which is capable of being cured by the common operation of tying the artery at some future time, at a distance from the wound; yet we cannot feel confident that either of these circumstances will ensue, but, on the contrary, are obliged to entertain constant apprehension lest the barrier afforded by the internal or external coagula should give way, and, in the first place, when the wound in the skin HAS united, a diffused aneurism should be formed requiring a ligature above and below the aperture in the vessel, but accompanied with an extensive suppurating wound, which might have been avoided if the vessel had been tied in the first instance; or in the second place, if the skin HAS NOT united, then we cannot but feel constant anxiety lest our patient be destroyed by a sudden gush of blood, or, as more frequently happens, be worn out by irritation and by loss of blood, from the no less fatal influence of frequently repeated smaller hæmorrhage.

8thly. But lastly, while I deprecate most strongly any reliance on the use of styptics in wounds of *large* arteries, I do not deny that they may sometimes be of service as *auxiliaries* in the case of hæmorrhage from *smaller* vessels; and if further experience shall prove that the "Liquide Hæmostatique" of MM. Talrich and Halmagrand is really superior in this respect to other styptics, I shall have as much pleasure in acknowledging the fact, as I have in ascribing to their distinguished countryman Paré the revival of the still greater security against hæmorrhage afforded by the ligature.

P. S. It may, perhaps, be interesting to those who are not convinced by my experiments of the small share of credit that styptics can claim in controlling hæmorrhage from large arteries, to be acquainted with the following summary of Dr. Jones's experiments, in which *no styptic* was employed; the knowledge of which induced me to perform my own, although of a different kind to his, with perfect confidence in their result; a confidence in his accuracy, and in the powers of nature, which was not deceived. Dr. Jones's experiments were performed upon the carotid, axillary, femoral, and humeral arteries of horses, asses, and dogs, and completely prove that where the integuments *are closed*, by far the majority of wounds of large arteries will be cured by very simple means, my own experiments serving to shew the same result with regard to open wounds.

1. Partial wounds 22; lived 19; died 3.

2. Secondary hæmorrhage occurred in 5; lived 2; died 3.

3. The kinds of wounds were

Longitudinal wounds	2;	Lived 2;	Died none.
Oblique wounds	3;	..... 2;	..... 1.
Transverse wounds of less than half the circumference.	... 3;	..... 3;	..... none.
Half the circumference cut	4;	..... 2;	..... 2.
Considerable (kind not stated)	1;	..... 1;	..... none.
Punctured wounds	9;	..... 9;	..... none.
	22	19	3

4. Died of secondary hæmorrhage 3. One lived for eighty hours; one lived six days; one lived for twenty-five days.

5. Dr. Jones also completely *divided* or *tore through* the same sized arteries, in nineteen experiments; tying the integuments in fifteen, and leaving the wound entirely open in the other four. Of these nineteen, six died, or were killed just before they probably would have died, the remaining thirteen all lived.

Of the six that died three were open wounds; in three the skin was closed by suture.

In four of the experiments the end of the artery

nearest to the heart was tied, of which one died, three lived.

In fifteen nothing was done to the artery; of which five died, ten lived.

Half Moon Street, Jan. 23d, 1832.

ON SOME EFFECTS OF INFLAMMATION OF THE MEMBRANOUS LINING OF THE LARYNX;

WITH SUGGESTIONS RELATIVE TO THE OPERATION OF BRONCHOTOMY; AND INCIDENTAL REMARKS ON SPASM AND WOUNDS OF THE THROAT.

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READ FEBRUARY 14TH A D 28TH, AND MARCH 13TH.

PART I.—LARYNGITIS.

Inflammation with swelling and thickening of the mucous membrane of the larynx, and of the subjacent cellular tissue, is not very uncommon; and it strongly claims our attention from the suddenness with which its alarming symptoms often appear, and the rapidity with which a fatal result is frequently produced. This disease occurs chiefly in adults. In many cases it comes on almost insensibly, and pro-

ceeds slowly. It is not usually complicated with inflammation of the tracheal or bronchial lining, or with inflammatory fever *. In its acute form it is generally attended with complete dysphagia, and in milder cases with impaired deglutition in a less degree. By these peculiarities it may be distinguished from croup; and, when examined pathologically, its effects are found to differ from those of croup, inasmuch as the change of structure consists of interstitial deposition, and not of effusion in the form of an adventitious membrane upon the surface of the inflamed mucous coat †.

Little doubt can be entertained that the writers

* "In angina membranacea febris concomitans inflammatoria est: in serosa febris comitans pituitosa, sæpe nervosa est." Goelis, Tractatus de rite Cognoscenda et Sananda Angina Membranacea.—Viennæ, p. 53.

Dr. Hecker states, that in the angina pituitosa, vel œdematosa, there is generally either a complete absence of fever, or the accompanying fever is either catarrhal or exanthematic. Von den Entzündungen im Halse, &c.—Berlin, 1809, p. 92.

† After certain forms of inflammation of the larynx, which essentially differ in their nature from croup, it is not uncommon to find a few distinct and delicate portions of adventitious membrane on the mucous surface: but these do not constitute the predominant morbid alteration. Such membranes have often been observed in co-existence with œdema of the glottis.

Dr. Bricheteau asserts, that sometimes a portion of false membrane contracts adhesions with the membrane of the windpipe, and constitutes, a long time after the termination of an attack of croup, a particular kind of affection. (Précis Analytique du Croup, &c., p. 345. Paris, 1826.) Is the deposition which characterizes croup capable of organization and growth?

referred to by Dr. Goelis * as authorities that croup may attack persons of the age of forty and sixty, were mistaken in the nature of the affection which they considered to be croup †. This talented physician, in deference to the opinions of certain authors, and not in consequence of having himself seen any case of croup at so advanced a period of life, states that no age is exempt from this disease ("nulli vitæ periodo hic morbus parcit.") Dr. Goelis adds, however, "præprimis tamen ætas infantilis a primo ad septimum ætatis annum ad eum est proclivis." He mentions that he treated a child at the breast, five months old, and refers to other instances of croup in sucklings. Dugès ‡ states that he has seen this disease in an infant eight days old.

"In no part of Britain, I imagine," says Dr. Cheyne §, "is croup more prevalent than in Leith and its immediate neighbourhood; yet, in the course of nearly fifty years of extensive practice, in which he has

* Lib. cit.

† It is clear that Valentin was deceived in this point. He mentions the case of Dr. Pitcairn, as a proof that croup may occur at the age of sixty. In the third volume of the Journal Hebdomadaire, 1829, there is given, under the inappropriate title of "Observation sur un Croup d'Adulte," the history of a patient, named Antoine, who died at the age of twenty-six, of a protracted inflammation of the glottis, brought on by excessive indulgence in spirit drinking and other intemperate habits.

‡ Dict. de Méd. et Chir. Tom. V. p. 569.

§ On the Pathology of the Membrane of the Larynx and Bronchia, p. 27.

attended many hundred cases of this disease, my father has not seen one instance of croup occurring after puberty, while he has attended many cases between the tenth and fourteenth year, both in delicate and robust children." Mr. Double*, who never had occasion, himself, to observe croup in an adult, admits, after a careful examination of recorded facts, that it may sometimes happen after puberty, but that the occurrence is much rarer than has been supposed. Dr. Mills† records a case of croup which proved fatal, in a Miss ——, aged twenty-six. "The lining membrane of the trachea and bronchi, was found inflamed, and covered with coagulable lymph." On dissecting the body of a girl, aged twenty, who died suffocated after a few days' suffering, Mr. Latour‡ found a membranous coating (couenne membraneuse) extending from the larynx to the division of the bronchia. Such unequivocal examples of the occurrence of croup at so late a period of life are, I believe, extremely rare.

The specimens of croup which I have seen in collections of morbid anatomy, induce me to mistrust the statements of Dr. Craigie§, that "it rarely affects the laryngeal membrane;" and that "the inflammation is seated in the tracheo-bronchial membrane

* Traité du Croup, p. 281. Paris, 1811.

† On the Morbid Appearances of the Trachea, &c., p. 7. Dublin, 1829.

‡ Manuel sur le Croup, p. 16.

§ Elements of General and Pathological Anatomy, p. 676.

solely." Bichat * and other French pathologists have come to a very different conclusion respecting the seat of croup. Dr. Desruelles † contends that it is essentially a disease of the larynx. Messrs. Roche and Sanson ‡ maintain that croup affects, almost always, the larynx and trachea. Dr. Bland §, who, like myself, adopts the latter opinion, has accordingly denominated this affection *laryngo-trachéite*, a name which Dr. Desruelles has, I think, decried unreasonably.

The distinction of croup from other forms of inflammation of the larynx, and an accurate knowledge of the seat of obstruction in each instance, are essential to successful treatment of the different affections. General bleeding, so highly beneficial in croup, seems often to have aggravated the sufferings, and hastened the death, of those affected with œdema of the glottis. Had the pathology of croup been better understood, laryngotomy would never have been declared to be the most efficacious means of relief.

In parts where cellular tissue abounds without any admixture of adipous substance, swelling is produced by different degrees of inflammation. The scrotum,

* Anatomie Pathologique, p. 97. Paris, 1825.

† Traité du Croup, p. 113. Paris, 1824.

‡ Nouveaux Elémens de Pathologie Medico-Chirurgicale; Tom. I., p. 383. Paris, 1828.

§ Nouvelles Recherches sur la Laringo-Trachéite, connue sur le nom de Croup. Paris, 1823.

for instance, may be thickened and enlarged by slow inflammation; or it may become tense and swelled by serous effusion, from active inflammatory affection. The like changes are observed in the prepuce and conjunctiva. They seem to exist also in the analogous submucous membrane of the glottis, according as it is acutely or slowly inflamed. "In many instances," says Dr. Craigie, "the margins of the glottis are occupied by an œdematous or puffy swelling, similar to that which occasionally affects the eyelids, prepuce, and female *labia*,—from sero-albuminous infiltration of the submucous filamentous tissue, and the effect of which is to diminish, or in some instances to obliterate, the aperture which regulates the admission of air into the trachea." *

To prevent obstruction in the mucous passages from accumulation of fat, the submucous membrane is reticular. This tissue is in small quantity and compact where it unites a mucous membrane to cartilage or bone,—more abundant and loose between such a membrane and other soft parts. In the larynx, where it abounds most at the root of the epiglottis and near the vocal ligaments, it was stated by Bichat † to be susceptible of serous infiltration, which might rapidly cause suffocation. In every such instance seen by Andral, a well characterized chronic

* Lib. cit.

† Anatomie Descriptive, Tom. II. p. 399.

inflammation had existed, and the œdema was a mere secondary phenomenon *. The previous disorder of the membrane may here, perhaps, have been merely increased by the supervention of a fresh exciting cause of inflammation, such as exposure to cold, improper diet, or any such source of aggravation †. In other instances the chronic forms of the disease may supervene to the acute. Œdema of the glottis seldom occurs as a primary acute inflammatory affection. It is generally preceded, sometimes followed, by a mild form of inflammation.

The swollen membrane may be indurated, or softened, or have its usual consistence. Dr. Cheyne has found it "like a thin layer of flexible cartilage."‡ Softening of the aerial mucous texture is

* Clinique Médicale, Tom. II., p. 206.—Andral admits, that "œdema of the glottis may occur as an idiopathic disease; but this is not the most common case, and it is ordinarily connected with *acute* inflammation (hyperémie aiguë) of the mucous membrane of the larynx. It is often developed during the course of chronic affections of this organ. It may be formed slowly, and never extend considerably, nor interfere much with respiration. At other times its rapid and great development suddenly produces asphyxia and death."—Précis d'Anatomie Pathologique, Tom. II. p. 495.

† "There exists always," says Dr. Albers, "in connexion with chronic inflammation a second disease, and one, indeed, which causes inflammation in the weakened part whenever a fresh source of irritation is superinduced."—Die Pathologie und Therapie der Kehlkopfskrankheiten, p. 69.

‡ Lib. cit. p. 175.

much rarer than of the intestinal, but frequently occurs in the larynges of phthisical subjects *.

It is often impossible to determine, during life, whether acute inflammation has caused serous effusion into the submucous tissue, or whether this part is swollen and thickened by gradual interstitial deposition. In his valuable "Observations on the Surgical Pathology of the Larynx and Trachea," Mr. Porter states, that the symptoms of chronic cynanche laryngea resemble in every respect those of laryngitis œdematosa; that the former inflammation commences so insidiously, and proceeds so slowly, as often to produce an incurable disease before the patient's attention is roused to the perilous nature of his condition; and that the latter is also, occasionally, very insidious in its approach. Two young men, who had retired to bed at night without complaining, were found dead from this affection the next morning †.

A modification of inflammatory action may produce a combination of both affections, and thus constitute an intermediate distinction, (LARYNGITIS CHRONICA ŒDEMATOSA,)—a variety described by Mr. Lawrence in the sixth volume of the Society's Transactions.

Inflammation of the membrane of the larynx may end in suppuration ‡: this occasionally happens in

* Clinique Médicale, Tom. II. p. 192.

† Porter's Observations, &c., pp. 95, 115, and 123.

‡ See the case of a shoemaker, aged seventy-one, related by

the genuine unmixed form of the complaint. It is more frequently seen where laryngitis is complicated with erysipelas or some other disease.

It appears to me, that the term SPASM is often used unwarrantably to explain the deaths of persons who have shewn symptoms of diseased larynx, and that the common notion of spasmodic asphyxia is dangerous, as it leads to the use of opiates and antispasmodics in disorders essentially inflammatory, and only to be treated with success by those who early discover and appreciate their nature and tendency. Dissection, certainly, seldom discloses in the larynx a complete obstacle to the transmission of air: this is not necessary to produce death. If the passage be gradually narrowed, so as to prevent at each inspiration the ingress of a proper quantity of air, the properties of the blood are consequently altered. The circulation of the fluid in an unhealthy state, produces a general debilitating effect: this is augmented by the fatigue resulting from the increased exertions which breathing requires. The imperfect expansion of the lungs causes in them a state of vascular congestion and consecutive serous effusion, which impedes the return of blood from the head, and gives rise to turgescence of the vessels of the brain with effusion

Mr. Costellat in the third volume of the Journal Hebdomadaire de Médecine, 1829. "Deux tumeurs existent à la place des ventricules du larynx. Elles sont formées d'une couche épaisse de pus concret combiné avec le tissu cellulaire sous-muqueux." p. 12.

into the cerebral cavities*. "Although," says Dr. Cheyne, in his remarks on croup, "apparently the first of the vital functions which is arrested be respiration, yet this seems to arise from a want of muscular strength in consequence of failure of the sensorial power, the invariable result of defective supply of pure arterial blood in the brain." † These patients, I believe, die more frequently from cerebral disorder and gradual exhaustion than from sudden or spasmodic suffocation ‡.

Moreover, the effects of disease upon living structures are often materially modified, and occasionally

* "Si un homme n'inspire que la moitié ou le quart de l'air qui lui est nécessaire, quelque sain d'ailleurs que soit le poumon, ses vaisseaux s'engorgent."—Louis, Mémoires de l'Acad. de Chirurgie, Tom. IV. p. 456. 4to.

† Lib. cit. p. 33.

‡ "Angina laryngea præ omnibus aliis multum detrimenti affert; respirationis summum periculum adest, inde pulmones non rite expanduntur, transitus sanguinis per easdem inhibetur, sanguinis in encephalo stagnationem, et apoplexiam sequi necesse est."—Tymm, Diss. Inaug. de Bronchotomiâ et Œsophagotomiâ, § 17. Gotting. 1793.

"Sunt etiam qui apoplexia enecantur quum impedita respiratione sanguinis copia in capite augetur. Novi etiam infantem, qui etsi recte spirabat, apoplexiam patiebatur, superorto cerebri hydrope conciliatam. Denique nonnullis debilitate mors adducitur, per oxygenii quidem in sanguine defectum. Qui opinantur morbum lethalem fieri, vel per tumorem membranæ pituitosæ, quæ in trachea est, ortum ab inflammatione, vel febris impetu, vel accedente pneumonia, errant, neque iis assentior. Certe exempla me fugiunt quibus id probetur."—Albers, de Tracheitide Infantum, p. 26.

obliterated, by death. As, on the one hand, necroscopic researches frequently reveal lesions which the symptoms had not caused to be suspected; so, on the other hand, these same symptoms do not permit a doubt, that an organ is sometimes seriously diseased, although it may not appear so on dissection. Inflammatory swellings, which in the state of life are red and prominent, disappear almost entirely after death*. In watching a child, dying of erysipelas of the head and face, I was struck by the rapid disappearance of the swelling and redness. This case impressed on me the justness of the remark, that it is not right to infer that inflammation has not existed in a part, because it is found of a pale white colour on examination of the body. Andral, who states that the morbid conditions of the aerial mucous membrane are identical in its whole extent, has found it perfectly white in individuals who exhibited all the symptoms of inveterate bronchitis †. The failure, therefore, to discover after death a change of structure, explanatory of the previous symptoms, is not a satisfactory criterion that no such change has existed ‡. I do not, however, remember any instance, in examining the bodies of persons who have died, apparently in consequence of laryngeal, bronchial, or pulmonary disease, in which

* Bichat, Anat. Pathol. p. 8. Paris, 1825.

† Cliniq. Méd. Tom. I. p. 175.—Précis d'Anatomie Pathologique, Tom. II. p. 464.

‡ "In aliis etiam morbis ecce quoties post mortem omnia signa inflammationis desint, ante eam non dubia?"—Albers, de Tracheitide Infantum, p. 107.

organic lesion was not found. Respecting laryngitis, Dr. Armstrong observes, that "respiration always grew more and more difficult, till at last death seemed literally to occur from suffocation, most probably occasioned by tumefaction within the larynx and about the epiglottis; as dissection showed that considerable inflammation had invariably existed there, without any other appearances sufficient to account for the fatal issue." *

The frequent absence of pain in chronic laryngitis is considered by Andral to be the more remarkable, as the healthy larynx is exquisitely sensible †. Inflammation of the iris may close the pupil without spasm, or the sufferer being conscious of the loss of vision ‡. The changes which narrow the urethra, do not usually excite any serious symptoms in their early stage: the patient is often first alarmed by the diminution of the stream of urine. With respect to what has been denominated spasmodic stricture of the urethra, it is remarked by Mr. Lawrence §, that in this case there is probably no real stricture in any part of the canal, but only an obstacle produced in some situation or other by the inflammatory tension, a partial enlargement in consequence of inflammation of some portion of the lining membrane.

* Practical Illustrations of Typhus Fever, p. 397.

† Cliniq. Méd., Tom. II. p. 208.

‡ See Lectures on the Diseases of the Eye, by Mr. Lawrence, Lancet, Vol. X. p. 257.

§ Lectures on Surgery, Lancet, 1830.

The phenomena of asthma have been attributed to sudden involuntary contraction of some part of the air-passages; and that kind of difficulty of breathing, which is considered to be periodical, (although the recurrence of the paroxysms is very irregular,) has been designated spasmodic or convulsive asthma.

Whether we examine the phenomena presented during the paroxysms of asthma, or in the intervals between them, we shall in neither case find the least necessity for inferring that this disease is of a spasmodic nature. On the other hand, various circumstances concur to show, that this peculiar variety of dyspnœa results from vascular congestion of the lungs, and particularly of their mucous membrane. The increased determination of blood to the lungs may be accompanied with, and is, I believe, in many cases a consequence of, some permanent alteration in the structure of the heart or large thoracic blood vessels. This view of the pathology of asthma, and a due regard to the influence produced on the economy by that fear and agitation which are inseparable from great oppression of breathing, will enable us to account for the leading features of the disorder, both in its active and passive stage; during the former, for instance, the pallid surface of the body, the anxious and haggard countenance, the coldness of the extremities, the small, frequent, and occasionally irregular pulse; the copious flow of limpid urine *,

* An involuntary flow of urine sometimes occurs during the

which does not begin until after the invasion of the paroxysm, and which, therefore, ought not to be said to occur "as in hysterical diseases"; the relaxation of the bowels, which have been described as acting with somewhat of the impatient hurry and imperfection of spasm; the excessive difficulty of breathing; the patient's eagerness to inhale cold air; the deficiency of respiratory sound, ascertained by auscultation; the gradual decrease of the severity of the attack; and the augmented secretion from the bronchial membrane, which marks its revolution. What better proof can be furnished of the unloading of gorged vessels, than the relief the asthmatic experiences by a spitting of blood, or by a copious mucous expectoration? In the intervals between the paroxysms patients are apt to contrast present ease with former distress, and represent that they are quite well. But in almost every case, says Dr. Forbes, there will be found, on examination, some permanent local disease of the organs of respiration, or of some other organ. Dr. Forbes likewise admits (and this admission is the more remarkable as emanating from a believer in the opinion, that the asthmatic fit consists in a spasm of the muscular fibres of the bronchi,) that "diseases of the bronchi, which produce a similar contraction of the air-passages by mere swelling of the membrane, namely, bronchitis, and an affection producing nearly the same physical condition of the

paroxysms of difficult breathing, which result from the presence of a foreign body in the windpipe. See the case of a little girl, related in the twenty-seventh volume of Rust's Magazine, p. 159.

parts from a sudden congestion of the blood-vessels, give rise to a state of respiration very like that which obtains in the asthmatic paroxysm."* If we further consider that this class of patients cannot endure the slightest unusual bodily exertion or mental emotion; that errors of diet, exposure to cold, in short any of those causes which disturb the balance of the circulation, especially such as produce irregular internal distribution of the circulating fluids, will commonly bring on a relapse; that asthma (like diseases of the arterial system, and unlike those of a spasmodic nature,) is more frequent in men than in women; that its obstinacy is proverbial; and, finally, that, while narcotics and anti-spasmodics more frequently do harm than good, those remedies which determine blood to the surface of the body, diaphoretics, (particularly the ipecacuan,) the vapour bath, warm pediluvia, and warm diluents, are the most efficacious means of averting the attack;—we cannot but see reason to conclude, that this is neither a "*pure*", nor a "*sympathetic*", nor a "*symptomatic nervous affection*", but that it is essentially a disorder of the pulmonary vascular system.

Dr. Rostan, physician to the large hospital at Paris for infirm and aged women, has had peculiar opportunities of investigating this disorder, and has taken considerable pains to show that it proceeds from a surcharge of blood in the lungs. In all the dissec-

* Cyclopædia of Practical Medicine, Art. Asthma.

tions of asthmatic subjects made at the above institution during several years, changes of structure were observed in the large thoracic vessels, heart, or lungs *.

When a permanent lesion exists, it is difficult to explain how the symptoms should be, as they sometimes are, only occasional, the intervals of the attacks being quite free from suffering. How, for instance, a person with an aneurism pressing on the windpipe, shall experience only now and then a paroxysm of difficult breathing; or another with a tumour encroaching on the brain, shall present merely occasional indications of cerebral derangement. If, as far as the larynx is concerned, this phenomenon be explicable by spasm †, how are we to account for it when the brain is affected, unless by irregularity of the circulation?

The rapidity with which blood may flow to, or leave, a part of the body, and the rapid influence of the mind upon the circulating system, are both dis-

* Rostan, Traité Elémentaire de Diagnostic, &c., Tom. I. pp. 371. 380. Paris, 1826.

† An elderly, emaciated, and imbecile patient, who lately died, in St. Bartholomew's Hospital, of an inveterate disease of the larynx, which was discovered after death to be cancerous, was pointed out to me as being affected with spasmodic exacerbations. There were certainly periods of extraordinary distress, and others of comparative ease. The former happened previously, and the latter subsequently, to the expulsion of a load of mucus.

played in the act of blushing, and in the erection of the penis. In the latter case we can further observe, how suddenly the magnitude of an organ may be altered by a change in the action of the blood-vessels. The momentary dizziness and obscurity of vision, produced by placing the head in a position in which the return of blood is obstructed, show how quickly important functions may be disturbed from an unusual fulness of certain vessels, and how soon restored, as the repletion subsides, without the occurrence of any change of structure.

In whatever textures inflammation occurs, we notice periods of exacerbation and remission. May not, then, the occasional aggravation of the symptoms in laryngitis be as fairly ascribed to a temporary increase of the inflammation as to an extraordinary action of the muscles of the larynx? Are the distressing paroxysms in peritonitis ever attributed to spasm of the abdominal muscles? In tetanus, or in hydrophobia, where violent spasms in the throat are remarkable, do they ever produce asphyxia? To conclude these desultory remarks on spasm, I have only to say, with the late Dr. Albers, of Bremen, "Neque adhuc vidi tracheitidem spasmodicam." *

The early symptoms of certain forms of laryngitis are liable to be mistaken for a slight cold. This error caused the death of a patient who was entrusted

* Lib. cit. p. 153.

to my care. Active measures were adopted as soon as breathing became oppressed, but were insufficient to counteract the mischief, occasioned by insidious inflammation.

CASE.

Thomas Cooper, a stout florid husbandman, aged forty, was received into St. Bartholomew's in November, 1830, with an ulcer, which had arisen from an injury a twelvemonth before admission, and had laid bare the ligament of the patella: the indisposition of this part to granulate caused the protraction of his complaint. Having always lived in pure air, and been accustomed to much exercise, confinement in the hospital injured his health, and altered his appearance. He complained of having caught cold, and was hoarse. I was called to the patient one afternoon, about an hour after he had been seen by the visiting surgeon, who, like myself, had not anticipated the imminent danger. He was propped up in bed, breathing with great difficulty and with a croup-like noise, and unable to speak. The countenance expressed great anxiety, and the circulation was much disturbed, apparently in consequence of the distress of breathing. I quickly took from his arm between forty and fifty ounces of blood, which gave immediate relief, without producing faintness. Leeches and a blister over the sternum were afterwards applied. The patient was kept for several hours under the influence of tartar emetic, and then took repeated doses of calomel. He ap-

peared to be going on favourably. But on the third night after the first suffocative attack, he suddenly fell back, while holding a cup of tea, which he was drinking, and expired in a few minutes.

The only disease discovered after death, was in the upper part of the larynx, where the increased vascularity and thickening of the internal membrane, which was slightly ulcerated just below the epiglottis, were incompatible with the maintenance of respiration. Although the symptoms in this instance were those of an acute disease, the thickened membrane possessed that firm and indurated character which is the result of slow inflammation. I therefore consider the affection to have been chronic *. The ulceration, which is often noticed in these cases after death, generally supervenes on chronic inflammation †.

CASE.

I lately saw an instance of œdema of the glottis in a patient, thirty-nine years of age, whose husband and infant were in St. Bartholomew's hospital at the

* "L'épaississement de la membrane muqueuse est une des altérations que la bronchite chronique produit le plus souvent." —Andral, Clin. Méd. T. I. p. 183.

† Dr. Cheyne represents that thickening of the laryngeal membrane is often followed by ulceration.—Essay on the Pathology of the Larynx, p. 178.

"Les laryngites chroniques ulcéreuses sont assez communes." —Andral, Clin. Méd. T. I. p. 180.

same time with her, all labouring under venereal affections. She had ulceration of both tonsils, and at the angles of the mouth. While the gums were sore from taking mercury, erysipelas attacked her head and face. A tumour, which seemed disposed to suppurate, formed below the jaw; but it disappeared under the use of leeches and poultice. As the erysipelas subsided, breathing became oppressed, but whether from cerebral disorder, or from extension of the disease of the fauces to the larynx, was doubtful. Tracheotomy was undertaken, with little expectation of success, as the patient seemed to be dying. She survived the operation half an hour. On examining the body, serous fluid was found in small quantity beneath the arachnoid membrane, in the texture of the pia mater, and in the ventricles. The brain was more vascular than natural. The soft palate, tonsils, and lining of the larynx were swollen; the latter was of a pale rose colour. The rima glottidis was much diminished by serous effusion into the membrane covering the chordæ vocales; and an appearance of ecchymosis was presented on the lingual surface of the epiglottis. Several small petechial spots, and patches of red discolouration, were observed on the internal surface of the stomach.

CASE.

Rebecca Tudor, a widowed shoebinder, aged thirty-three, was received into St. Bartholomew's on Friday morning, the 8th of April, 1831. I found her

sitting in bed, leaning forwards, breathing with great difficulty and with a slight croaky noise, and making every now and then feeble suffocative attempts to relieve herself by coughing. The countenance was pale and approaching to lividity; the lips were covered with a dry blackish secretion; and the tongue was furred, brown, and dry. She could hardly whisper or swallow; but pointed to her throat to describe the seat of her uneasiness. The pulse was extremely low, and intermitted about every tenth stroke. The extremities were getting cold.

I afterwards ascertained that she generally enjoyed good health, and had never before been troubled with cough or difficult breathing. She had suffered, during the previous two or three months, occasional attacks of hoarseness, without pain in the throat. On the Monday before admission, whilst the catamenia were flowing, she was hoarser than usual, and swallowed difficultly. On Thursday evening, when she became much worse, a large quantity of blood was abstracted from the arm, medicine having been taken, and a blister applied in front of the larynx, without producing any remission of the symptoms. The patient considered that her complaint was aggravated by the venesection.

Dr. Latham, who had the care of the patient, decided upon the immediate employment of tracheotomy; and Mr. Earle performed the operation at ten, A.M. The relief, given by the introduction of

the canula, was complete. She dozed shortly after the operation, and at half past three, P.M. was breathing comfortably. (Thirty minims of laudanum at night, and smaller doses occasionally when necessary.)

10th. The canula was removed last night, being obstructed by mucus. It was left out for three hours, during which time the patient enjoyed some refreshing sleep, and was then replaced, as distress of breathing returned. Deglutition is difficult and painful. (Five grains of calomel immediately, and to be repeated four hours afterwards.)

11th. She was much disturbed in the night, when the canula became clogged. I removed the instrument, with the intention of cleaning and replacing it, but as breathing was carried on easily without the tube, I determined to defer its re-introduction until the symptoms should require it. About an hour afterwards I gently separated, with two directors, the cut edges of the trachea, to make room for the expulsion of some thick mucus which interrupted breathing. This relieved her immediately. As the difficulty recurred on the directors being removed, I excised a portion of the trachea by a longitudinal semilunar incision, which afforded the same relief as when the parts were held asunder. The calomel occasioned sickness, and acted freely on the bowels. (Five grains of the blue pill night and morning.)

12th. She breathes easily, except when the arti-

ficial opening is obstructed by mucus. A camel's hair-brush dipped in oil, with which she sweeps the course of the wound, enables her to overcome this interruption. Her voice is much improved, as well as the power of swallowing. The mercury has produced salivation with soreness of the gums. (The blue pill only in the morning, and the opiate at night continued.)

18th. The integuments beneath the chin, where the blister was placed, have been raw, inflamed, and very painful. A few leeches have been applied: yesterday the part was punctured, and a teaspoonful of thick pus was discharged. Respiration is well performed, partly through the glottis, and partly through the wound.

21st. Leeches were re-applied, as the parts continued sore and swollen. The inflammation about the wound is subdued. The pulse small and frequent; the tongue clean; bowels relaxed. (Five drops of laudanum every hour till the bowels are quieted. Broth diet, with four ounces of wine daily.)

27th. She breathes and swallows well, and speaks naturally. Air escapes through the opening only when she coughs.

May 3rd. The wound is healed, but the neighbouring parts are hard and swollen. (Six leeches and poultice to the swelling.)

5th. The patient has had cough with impaired deglutition during the last few days, and can now only swallow fluids with difficulty. (A small blister below each angle of the jaw. Two grains of calomel with half a grain of opium every night.)

6th. Every attempt to swallow is attended with a convulsive struggle. Mucus, intermixed with blood, is now and then thrown up by an effort of retching. Nothing is discoverable on inspection of the fauces to account for these symptoms.

8th. Some yellow matter was vomited in the night. The general aspect and powers of the patient are improved, and the functions of breathing and ingestion are unimpaired.

11th. A hard inflammatory swelling is seated at the upper part of the sternum. (Twelve leeches and poultice to the swelling.)

17th. An abscess was opened at the root of the neck.

24th. The patient, being perfectly recovered, was dismissed from the hospital.

That the formation of matter in the neck, observed in this and in the preceding case, occurred in consequence of the use of mercury, I am inclined to believe, from having noticed this effect in other in-

stances. Whether this medicine had any influence in producing the inflammatory affection of the larynx * in the former case, or whether the inflammation of this part was erysipelatous, may admit of dispute. Lisfranc † states, in his commentary on œdema of the glottis, that this disease is very easily developed during the progress of phthisis laryngea, and while the system is under the influence of mercury. Mr. Lawrence has communicated to the Society the history of a patient who was supposed to have taken cold after a violent salivation. He became hoarse and affected with considerable difficulty of breathing. Bronchotomy was performed, but too late to be serviceable. By this operation Mr. Benjamin Bell ‡ gave immediate relief to, and preserved the life of, a patient who was in imminent danger of suffocation from the effects of mercury. Pelletan relates the case of a woman who suffered from chronic swelling of the laryngeal membrane, which ended fatally. She had undergone five or six courses of anti-venereal treatment; and to this circumstance Pelletan ascribes her disease §.

* On the evening when this paper was read to the Society, Mr. Arnott mentioned, that he had had, within a short period, two individuals under his care, who were attacked with acute inflammation of the windpipe, while taking mercury for some chronic complaints not venereal.

† Journal Général de Médecine, par Gaultier, Tom. LXXXIII., 1823.

‡ A System of Surgery, Vol. V.

§ Clinique Chirurgicale, Tom. I. p. 19.

CASE.

I examined, at St. Bartholomew's, the body of a man, who was thirty years of age and of spare habit, and who had been treated with calomel and opium for a node on the tibia. Through negligence, he took a much larger quantity of the remedy than was ordered. Difficulty of swallowing, with hoarseness, supervened, and the pulse was then so feeble that wine and brandy were deemed requisite. For the affection of the mouth, which was not so severe as to induce an opinion that the mercury had acted prejudicially on the system, a solution of borax and honey, with tincture of myrrh, was prescribed. No marked symptoms of disturbed breathing were noticed. The patient died twenty-one days after the commencement of the mercurial treatment, and six days after its discontinuance. The larynx, and the trachea at its upper part, presented marks of inflammation of the most acute kind, with a few small ulcerations of the mucous membrane of the former, having a tawny and sloughy aspect. The inflamed membrane retained its very florid colour long after death.

A remarkable connexion is observed in the exanthemata, between the cutaneous disease and inflammation of certain parts of the mucous system. The throat, in particular, is apt to suffer in eruptive fevers. It is therefore in no wise extraordinary, that, in some cases of erysipelas, the lining membrane of this part

should be inflamed *; and that, if this peculiar kind of spreading inflammation be allowed to proceed unchecked, it should affect the larynx and produce suffocation. Rosen observed, in Sweden, the coincidence rather than the complication of croup *(laryngitis?)* with eruptive diseases. Rush frequently noticed the coincidence of croup with acute exanthematic eruptions †. Dr. Albers states, that scarlet fever is very frequently accompanied with inflammation of the larynx; and that in smallpox and measles this organ is also apt to suffer ‡. Yet, in the course of several epidemic scarlet fevers which Dr. Bretonneau had an opportunity of observing during twenty years, and some of which were so serious that a great number of patients died, it never once happened to him to see death caused by closure of the glottis from propagation of the inflammation to the larynx §. Among the cases of œdematous angina related by Dr. Bouillaud ||, is that of a sempstress, who, in consequence of over-eating, became affected with erysipelas of the face, which extended to the neck and scalp. On the fifth day the erysipelatous inflammation was much in-

* "Dans l'érysipèle de la face l'inflammation se propage quelquefois dans le pharynx et la caisse du tympan." Roche et Sanson, Nouveaux Elémens de Pathologie Medico-Chirurgicale, Tom. I. p. 269.

† See Bricheteau's Précis Analytique, &c. p. 344; and Valentin's Recherches sur le Croup.

‡ Die Pathologie und Therapie der Kehlkopfskrankheiten, pp. 13. 57.

§ De la Diphthérite, &c., p. 249. Paris, 1826.

|| Archives Générales, Février, 1825.

creased; the throat was painful, deglutition difficult, and respiration accelerated. She died in a state of asphyxia on the seventh day from the commencement of her illness. Venesection was not employed, nor were leeches applied until two hours before death. On examination, the cellular tissue of the neck and of the larynx was found to be the seat of abundant serous infiltration.

Latour twice saw inflammation of the larynx in connexion with erysipelas: he found blisters very beneficial in these cases *. Forestus † mentions, that he attended upon a baker, who was nearly suffocated by cynanche of the throat occurring at the same time with erysipelas of the face: but whether the larynx was the seat of inflammation in this instance is uncertain, as the treatment was judicious, and the patient recovered. Dr. Stevenson has given an abstract of some cases of erysipelas affecting the face and head, and accompanied with inflammation of the fauces. In many of these instances the disease terminated without extending further than over the soft palate, uvula, and back of the pharynx; but, "in a few it spread to the larynx, producing a state of respiration very like that of idiopathic croup."‡

* Encyclopädisches Wörterbuch der Medicinischen Wissenschaften, Vol. II. p. 536.

† Obs. et Cur. Med. ac Chir. opera omnia; Lib. XV., Obs. 20.

‡ Transactions of the Medico-Chirurgical Society of Edinburgh, Vol. II. The third volume of the same work contains

Of seventeen cases of œdematous laryngeal angina, observed by Bayle during six years, only one ended in recovery. This intelligent physician warned the profession not to be deceived by the apparent mildness of the disease *, and recommended a prompt recourse to laryngotomy; although he appears to have possessed, at the time his memoir was published, no personal experience of the efficacy of this proceeding.

Dr. Baillie, after relating three fatal cases of inflammation of the larynx in adults, states, that the disease had a strong resemblance to croup, but is still to be considered as different from it; and that both general and topical bleeding when employed early and strenuously were of no use †.

Dr. Armstrong witnessed a far greater mortality in laryngitis than in any other inflammatory disease. One of his patients died in eight hours, and another in seven, from the commencement of the symptoms.

an account, by Dr. Gibson, of the Epidemic Erysipelas which appeared in Montrose in 1828. "Sometimes the internal fauces were attacked; and if it spread to the trachea, it generally proved fatal." p. 95.

* "Le peu de gravité que parait offrir la maladie chez un sujet qui se lève et qui n'a pas perdu l'appétit, ne doit pas faire illusion; l'expérience prouve d'une manière trop cruelle combien il est dangereux, dans cette circonstance, de se livrer à un espoir mal fondé." Nouveau Journal de Médecine, Janvier, 1819, p. 21.

† The Works of Dr. Baillie, with an account of his Life, by James Wardrop, Esq., Vol. I. p. 64.

In another case, the loss of 160 ounces of blood, within six hours, gave temporary respite to the difficulty of breathing; yet, so far from arresting the inflammation, death took place within twenty-four hours, in despite of antimonials employed towards the close *.

"Since my appointment to the Fever Hospital, I have seen", says Dr. Tweedie, "four individuals die from cynanche laryngea, *two of these were convalescents from scarlet fever;* and from what I observed in these cases, I am satisfied that when the larynx is attacked with acute inflammation, which generally terminates rapidly in œdematous swelling of the glottis, and the subsequent death of the patient by strangulation, the only chance of saving the unfortunate sufferer is by having immediate recourse to the operation of laryngotomy. This is more especially imperative when the disease occurs in connexion with fever, because, although the cases I have seen in the hospital came on during the period of convalescence, yet the powers of the patient were not sufficiently recruited to admit of the active treatment a disease so truly alarming instantly demands." †

Since bloodletting and other antiphlogistic and internal means, even when employed under auspicious circumstances, have generally failed to relieve that in-

* Practical Illustrations of Typhus Fever, p. 393.

† Clinical Illustrations of Fever, p. 35.

flammatory affection of the laryngeal membrane which is attended with interstitial effusion*; and since the few instances in which tracheotomy has been tried have been marked by signal success, it is to be hoped that the experience obtained by the loss of numerous patients, will rescue from premature death many future sufferers from this insidious and destructive disease.

PART II.—BRONCHOTOMY.

The obstruction of respiration by the diseases of the larynx above described, generally admits of relief by bronchotomy. In croup, where breathing is impeded by changes in the trachea and bronchial tubes, as well as in the larynx, this operation is almost invariably useless†. Whether it is ever advisable in cer-

* Mr. Lawrence, speaking of the treatment of phlegmonous erysipelas, observes, "I have found that venesection exerts but little influence over inflammation of the cellular texture". See his "Observations on the Nature and Treatment of Erysipelas", in the fourteenth volume of the Society's Transactions, p. 67.

† Dr. Goelis states, after having made publicly forty-three dissections of children who died of croup,—"pseudo-membranæ sedes variæ partes tracheæ et bronchia sunt, majorem nunc, minorem eorum partem tenet, quin immo per tracheam integram et bronchia ad minimas usque ramificationes extenditur." Lib. cit. p. 84.

The seventh case related by Lobstein, in his instructive communication in the eighth volume of the Memoirs of the Medical Society of Emulation at Paris, is that of a child three years of age, whose disease was of such short duration that the production

tain paroxysms of dyspnœa, which seem to depend upon some unusual condition of the larynx, and to arise from sympathies which we do not comprehend, appears to me very doubtful. Inexperienced in the affections described under the ambiguous terms of cerebral croup and purely spasmodic croup, I have referred to the opinions of others upon this subject, but found nothing satisfactory to guide my conduct. "In purely spasmodic croup, where there is reason to believe that no organic disease whatever had existence in the windpipe, the operation," says Mr. Porter, "might not only be resorted to at the moment of attack, but probably offers the means of re-

of false membrane was not expected. This, however, was found, on dissection, in the larynx and uppermost part of the trachea. The mucous membrane of the windpipe lower down was unaffected, and the body was healthy in all other respects. Tracheotomy might, perhaps, in this instance have proved serviceable, in conjunction with other treatment. "In unico tantum casu", says Dr. Goelis, "in quo membrana in unum punctum contracta et concentrata est, hujusque puncti sedes certissimis signis indicari potest, in transudationis stadio tracheotomia institui posset; quam rarum tamen hoc phenomenon sit, quam difficilis et ardua illius cognitio, neminem latere arbitror. In quadraginta tribus extipiciis ne semel quidem vidi, et in nullo authorum signum pathognomonicum, quo pseudo-membranæ sedes indicatur, annotatum invenio." (p. 134.) Dr. Albers proscribes, without reserve, the employment of tracheotomy in croup. He observes, "sæpius inflammationem in bronchis, quoad cartilagines habent, distinctam deprehendimus:"—"et profecto nullus, qui tracheitidem bene perspexit, aut cogitabit de tracheotomia, aut soli incisioni fidem habebit." De Tracheitide Infantum, pp. 109. 153.

suscitation, if very speedily adopted subsequent to apparent death." The admission, that this proposal is solely supported by theory, is, perhaps, equally applicable to the remark, that "the spasm in the muscles of the glottis remains some time after death, and will effectually prevent the passage of any air." * Mr. Porter states no case to warrant a belief that spasm ever produces death by suffocation.

Dr. Albers, of Bonn, speaks of a state of disease, observable particularly in girls who are subject to irregular menstruation, in which the larynx is so irritable, that, on the slightest occasion and usually towards evening, it becomes affected with spasm, which is to be quieted by nothing, not even by musk and opium. It is attended with a dry cough, which will continue for two or three hours without interruption, and not cease until the patient falls into a swoon, or even into convulsions. "I have seen", says Dr. Albers, "these symptoms regularly repeated every evening for two months together. In this case, as also in every instance where such spasm is produced, should not tracheotomy be employed to remove this troublesome and highly dangerous condition? Particularly as this affection continues to be regularly repeated even when the menstrual functions are performed, and as the patient is liable every moment to be suffocated." †

* Lib. t. p. 52.

† Graefe and Walther's Journal, Bd. XV. Heft 4.

I should prefer trying the effect of some powerful revulsive agent, such as sudden immersion in cold water, a shower bath, the croton oil, or an emetic *, before proceeding to tracheotomy, which would here be less eligible than the operation advised by Desault †. Loss of blood by cupping on the uterine re-

* The superiority of tartar emetic and ipecacuanha over the usual remedies called antispasmodics, was noticed by Michaelis, who strongly commends the latter medicine in spasmodic affections of an hysterical character; and adds, that it seems to increase in efficacy in proportion to the nausea which it produces. De Angina Polyposa sive Membranacea. Gotting. 1778, p. 242. Dr. Albers, also, remarks, "Emetica magnam virtutem habent contra spasmum."

In acute laryngitis antimonial emetics are more efficacious than blood-letting; they are also the best internal remedy in croup. Cabanis states, that in the affections of mucous membranes emetics are generally more useful than purgatives; and that they are particularly advantageous in catarrhal inflammation of the nose, throat, or lungs. The fact is, says Cabanis, a great many more anginæ are cured by emetics than by bleeding. Œuvres Complètes, tom. II., pp. 130, 146, Paris, 1823.

Bearing in mind the obscurity which attends the development of disorders of the larynx, and their liability to be confounded, we cannot fail duly to appreciate a remedy, advisable under a variety of circumstances, generally determinate in its action, and admirable in its effects.

† "Hippocrate avoit déjà établi que dans le cas de suffocation il convient d'introduire une canule dans l'ouverture, supérieure du larynx. Ce moyen, généralement abandonné, et préconisé de nouveau, d'après une observation de Desault, ne serait proposable que dans certains cas d'affection spasmodique et passagère des muscles du larynx; et alors il faudroit que la canule, faite de gomme élastique, eut une forme et des dimensions proportionnées à l'étendue et à la figure de l'ouverture de la glotte." Sabatier, Médecine Opératoire, tom. IV., p. 89.

gion immediately relieved an hysterical Parisian girl, who had not menstruated, and who was apparently affected with croup. The symptoms recurred, and were again subdued by the same remedy *.

The state of the larynx, which results from attempting to swallow boiling water, has been considered to require bronchotomy. From seeing a solitary case, in which this practice completely failed, I was hastily induced to esteem it of equivocal benefit; concluding that, in this accident, death was not caused by direct obstruction of respiration from the local injury, but by the general disturbance of the constitution, excited by the acute affection of a part of such exquisite sensibility and essential importance to the support of life. An account by Dr. Burgess, in the third volume of the Dublin Hospital Reports, of two cases of scalding of the mouth and throat in which bronchotomy was performed, has since assured me of the expediency of trying this mode of relief. The operation might also be of service in the case of any strong or corrosive liquid being applied to the fauces, and occasioning obstruction of the glottis.

The propriety of bronchotomy in laryngeal disease, and the prognosis of the operation, will be materially influenced by the state of the lungs, which we must endeavour to ascertain from the history of the complaint, the appearance and quantity of the expectorated matter, and by the aid of auscultation and per-

* Desruelles, Traité du Croup, p. 295.

cussion of the chest. Previous to the operation the stethoscope is unusually profitless as a means of diagnosis. The most experienced in the use of this instrument have regretted the little advantage derivable from its application in these cases, in consequence of the diminished supply of air to the lungs, and the noise and confusion produced by each violent effort of inspiration. "It is scarcely credible how far the existence of laryngeal obstruction tends to mask all the stethoscopic phenomena, even in cases of extensive pulmonary disease."*

There are, perhaps, no symptoms that more frequently puzzle practitioners than those which seem to depend on affections of the larynx. Disease of the liver is sometimes attended with symptoms of cynanche laryngea, although no morbid appearances are presented in the larynx after death †.

* Remarks by Dr. Graves and Dr. Stokes; Dublin Hospital Reports, Vol. V., p. 80.

Mr. Mac Namara derived great assistance from the use of the stethoscope in the case of a boy who was much distressed by fits of cough, from a plumstone having passed into the windpipe, The Lancet, Vol. I., 1829—30, p. 78. And, in one of the cases published by Dr. Reiche, (Rust's Magazine, vol. 27,) the presence of a foreign substance in the right bronchial tube was ascertained by the aid of this instrument. The practitioner, who first treated the child, considered that it was labouring under croup; and leeches, emetics, and calomel had been employed.

† Bonetus, Sepulchretum, Tom. I., Lib. II., Sect. I., Obs. 4.

Dr. Albers states, that liver complaints very frequently dispose to œdema of the glottis.—Die Pathologie der Kehlkopfskrankheiten, p. 106.

Mr.

In the progress of fever and in the acute eruptive disorders of children, abscesses are sometimes formed in the neighbourhood of the glottis, which give rise to all the symptoms of croup *.

A child, eight months old, died with symptoms of cynanche laryngea, which were evidently occasioned by the pressure of an abscess in front of the thyroid cartilage, and bounding nearly the whole extent of the os hyoides. The internal lining of the air-passage was found healthy. The narrator of this case regrets, with much propriety, that the abscess was not discovered before death †.

Mr. Lawrence has related the case of a young woman, under twenty years of age, who died suffocated from an aneurism behind the sternum pressing on the trachea. Her symptoms were so deceptive that it was supposed bronchotomy would be required ‡.

The sixth case detailed in the important Memoir

Mr. Louis has given an interesting detail of a water-bailiff, aged twenty-three, who died suffocated in consequence of œdema of the glottis. Three large abscesses were found in the liver, and purulent formations in different parts of the body. The submucous membrane of the larynx was irregularly protuberant from serous infiltration.

Mémoire sur les abscès du foie, in the first volume of the Répertoire Général d'Anatomie, &c.

* See the article Abscess, by Dr. Tweedie, in the Cyclopædia of Practical Medicine.

† Edinb. Med. and Surg. Journal, No. 62. 1820.

‡ Med. Chir. Trans. Vol. VI. p. 261.

of Bayle, is that of an aneurismal tumour, compressing the left bronchia, and simulating œdema of the glottis. "I did not," says Bayle, "see this case, but am persuaded that I should have taken the disease for œdema of the glottis."*

I know an instance where this mistake led to the performance of tracheotomy, which was attended with bursting of the aneurism into the trachea: and, from a preparation which I lately saw in the College of Surgeons, it appears probable that the same unexpected event must have annoyed another practitioner. In this preparation there is an artificial opening in the larynx; and just above the bifurcation of the trachea another opening is seen to communicate with the cavity of the ruptured sac of an aneurism.

Dr. Hope affirms, that bronchotomy has several times been performed with the view of obviating suffocation occasioned by aortic aneurism †.

It is unnecessary to multiply instances to prove the importance of minute diagnostic research. The obscurity in which the diseases of the larynx are often involved, and the serious errors of practice to which an ill-founded opinion may lead, should induce us to investigate with great care every disturbance of respiration, especially where the source of suffering seems to be in the larynx. Before tracheotomy is

* Nouveau Journal de Médecine, Janvier, 1819, p. 22.

† The Cyclopædia of Practical Medicine, p. 110.

undertaken, the actual seat of the disorder must at least be determined. The coexistence of any important pulmonary lesion will of course considerably interfere with the prospect of a favourable issue. We are not, however, to be deterred from operating either from the supposition or assurance that the lungs are simultaneously disordered with the larynx. If the cure of the disease were therefore out of the question, the operation, by lessening the frequent necessity of coughing to get rid of the increased mucous secretion, and the consequent fatigue to the lungs at a time when their unhealthy condition requires all possible repose, might yet obtain for the patient alleviation of distress and prolongation of life.

Although the opinion, that bronchotomy is too seldom performed, has been repeatedly and, I think, judiciously expressed; likewise that, when it has been undertaken, its advantages have been frequently lost by delay; the general rule has been to operate only in cases of imminent danger. Excepting in the removal of a foreign substance from the wind-pipe, the avowed object of the operator has been merely to make a way for the free passage of air, to avoid impending suffocation; without reference to the consideration, how far the operation might serve to arrest morbid action, by affording rest to the affected organ, and preventing the irritation caused by its constant exertion while in a state of disease. The advantages of performing bronchotomy *very early* in cynanche laryngea, and the dangers attending its delay,

have been exposed by Mr. Lawrence. The Germans, however, claim the merit of having advised and practised the operation, in cases of chronic inflammation of the larynx, where no immediate assistance was required to preserve life *. Would not the cure of this affection be more frequent, if an artificial opening were made earlier than it has usually been, and at as great a distance as might be convenient from the diseased part †, so as to interrupt as little as possible the restorative process? If tracheotomy will not remove the laryngeal disease, it may facilitate breathing, and

* Gräfe and Walther's Journal, Vol. XV. p. 526.

† An extraordinary obstacle to the successful performance of laryngotomy occurred in a case of œdema of the glottis, related by Laennec in the Memoir of Bayle. Instead of introducing the canula into the cavity of the larynx, the surgeon, who is justly celebrated for his skill and experience, passed the instrument between the thyroid cartilage and the mucous membrane, which adhered loosely to the cartilage in consequence of the disease. The advantage of selecting a healthy part to operate on, is as obvious in this instance as in the performance of amputation, or of tying an artery for aneurism. "Infra locum affectum, (says Bergier,) fieri ut plurimum queat asperæ arteriæ sectio." Richter preferred the making of the opening in the trachea at a remote distance from the larynx, to avoid injuring the isthmus of the thyroid gland, and because, as he says "inasmuch as the larynx is more impatient of irritation than the trachea, there is reason to apprehend that, when the canula is placed high up, more serious accidents will occur, than if it be placed lower down."—Anfangs-gründe, &c. Vol. IV. § 347.

Sabatier, however, considered a wound of the middle portion of the thyroid gland to be a thing of little importance, since this lobe is nearly always very small, and it contains no considerable vessels.—Médecine Opératoire, Tom. IV. p. 87.

thus preserve the powers of the patient until nature effects a cure, either spontaneously, or with the aid of art. It is hardly necessary to express a caution against determining precipitately on the operation, or resorting to it in the commencement of a slight attack. As in strangulated rupture, there is much more reason to apprehend improper delay, than too speedy recourse to the use of the knife.

When the symptoms of laryngitis are developed, and the inefficacy of ordinary means is evident from the daily increasing distress and weakness of the patient, from the failing voice, difficult respiration, and exhausting cough, tracheotomy should be at once performed; for if delayed to a later period, the chance of recovery will be materially lessened, and often entirely lost. The surgeon too often waits for symptoms which threaten immediate suffocation. Yielding to the fears and objections of the sick person and his friends, or to the common notion of the vulgar respecting the danger of wounds of the windpipe; or perhaps thinking to justify the operation by showing that, under the circumstances in which it was undertaken, a doubtful remedy is better than none at all*; he defers the use of the knife until extreme distress induces the dying man to submit to any mode

* "C'est par de semblables considérations que les moyens les plus salutaires sont negligés ou tout-à-fait abandonnés. Dans un art qui a la vie des hommes pour objet, on ne scauroit imaginer combien une fausse idée peut être meurtrière."—Louis, Mém. de l'Acad. Royale de Chirurgie, Tom. IV. p. 488. 4to.

of obtaining relief: and thus a measure, most salutary when adopted at the proper period, is brought into disrepute, because its employment is postponed till a favourable result is no longer possible.

An opinion has been entertained, that bronchotomy is "only likely to be attended with success in the more acute affections of the larynx, and is not at all advisable in cases of ulceration."* This opinion appears to me to be erroneous. Although I have seen no unequivocal instance of cicatrix of the laryngeal membrane, I cannot doubt that it might occur here as in other mucous membranes; and I know no reason whatever for regarding the existence of ulceration, even if its presence could be ascertained, as an objection to the operation.

The little success which has attended bronchotomy in the treatment of laryngeal diseases, must be attributed partly to its having been performed in cases to which it was inapplicable, partly to the delay of its performance, and partly to the injury inflicted by the instruments used. The operation presents nothing formidable. It has often been successfully undertaken for the purpose of extracting extraneous substances from the windpipe. In the latter cases, however, when the source of danger has been removed, the part is not irritated by the introduction of a larger foreign body.

* London Medical and Physical Journal, Vol. XLIX. p. 367.

As a simple longitudinal incision will neither permit the easy entrance or continuance of a canula in the windpipe, nor the necessary passage of air and escape of mucus when this instrument is not used, it will generally be better to remove a portion of the trachea, and form an opening for respiration as large as the natural area of the rima glottidis: which proceeding, if properly effected, will cause no inconvenience, but afford the best assurance of the patient's safety. The surgeon may then go from the bed-side, satisfied that he has left ample space for freedom of breathing and expectoration. The injunction of a recent writer, "that no patient, on whom tracheotomy has been performed, should be left one minute for at least several days afterwards," only requires observance when an instrument, like that which this gentleman has recommended, is employed. With much more reason, I think, we may venture to establish a rule, that no person, labouring under disease of the larynx, be left by the medical attendant, unless bronchotomy has been properly performed.

In the case, related by Mr. Lawrence in the sixth volume of the Society's Transactions, of Hannah May, a young woman who underwent bronchotomy for laryngeal disease, and could not wear a canula, death appears to have taken place in consequence of the omission to remove a sufficient portion of the trachea; and in the narrative by Dr. Latham, appended to Mr. Lawrence's remarks on affections of the larynx, it appears to me that the chances of the

patient's recovery would have been materially improved, if the irritating means employed to keep the edges of the wound asunder had been superseded by the operation of making in the first instance an ample artificial opening.

In a fatal case of angina laryngea occurring in a child five years of age, upon whom Dr. Wedemeyer of Hanover performed laryngotomy without employing a canula, the operation was attended with some unpleasant circumstances which might easily have been avoided or remedied. The crico-thyroid muscles and the fat escaped for the most part from the knife on cutting into the air-tube, so that they were not cut so freely as the larynx; and consequently they narrowed the opening of this organ during its movements. Besides, the larynx, in the acts of deglutition, inspiration, coughing, and in certain motions of the neck, was often drawn above and below the wound of the skin: thus the correspondence of the external wound with the wound of the larynx was frequently lost *.

An instance of the same accident is recorded in the Memoirs of the Academy of Surgery.

" A soldier was attacked with inflammation of the larynx, which proceeded so rapidly that on the second day he was in extreme danger. The eyes were red and protuberant, the countenance was livid, and the

* Gräfe and Walther's Journal, Vol. IX. p. 107.

sense of suffocation so distressing that the patient was ready to tear open his throat. Blood was taken from the arm and foot at the same time; but the symptoms continued pressing, and bronchotomy was deemed necessary to save life. A longitudinal incision was made through the integuments; the sterno-laryngeal muscles were then separated, and the trachea was opened transversely between two of its rings. No sooner was this done than the flow of blood into the windpipe from the small wounded vessels, excited very violent cough; and the canula could not be retained in its situation, although it was several times replaced. The patient breathed very little, or hardly at all; for the opening of the trachea was only parallel with the external incision during certain movements. The continuance of bleeding into the canal considerably increased the danger. Perceiving the extremity to which the patient was reduced, the surgeon enlarged the wound by extending the incision of the trachea downwards. Cordials were administered, and the patient's head was bent forwards. The next day natural breathing was restored; and in a few days the wound was cicatrized."* These cases show the necessity of making a free external incision.

Richter† rightly observes, that the greater the length of the external wound, and the more its sides

* Tom. I. p. 581, 4to.

† Anfangs-gründe, &c. T. IV. § 344.

admit of being separated, so much the easier will be the subsequent operative proceedings.

The principal danger in bronchotomy, as in the accidental wounds of the windpipe, consists in the risk of suffocation from the influx of blood into the canal. The operator should, therefore, carefully secure all bleeding vessels before he removes a portion of the trachea. If, after tying some, blood should still ooze from certain points, the application of the nitrate of silver may be useful. Hemorrhage from the thyroid veins has sometimes been so violent, during the operation, as to induce the surgeon to leave it unfinished. Such was the case in a child whom Dr. Bricheteau * saw operated on by a skilful surgeon of Paris. A similar instance is said to have presented itself to Desault; in considering which, it should not be overlooked that, in the state of impending suffocation, all the cervical veins are preternaturally distended, and that the hemorrhage is most likely to be stopped by cutting into the trachea, and removing the cause which maintains the vessels in their turgid condition.

The division of the soft parts caused so much bleeding in a child who was recently operated on at St. Bartholomew's, that the surgeon was obliged to remove the little sufferer to bed from the operating theatre without having opened the trachea, and to ef-

* Précis Analytique du Croup, p. 418, Paris, 1826.

fect this part of the operation after waiting about half an hour for the cessation of bleeding.

Mr. Porter relates the case of a little girl, affected with croup, upon whom tracheotomy was performed. At the first incision some superficial veins were wounded, which poured out blood in fearful abundance. Some of the thyroid veins were divided, and this still added to the hemorrhage; nor was it deemed advisable to open the trachea until after the lapse of half an hour, lest the flow of blood into the windpipe should suffocate the patient *.

Scarcely had Professor Roux opened the trachea of a young woman, on whom he operated in consequence of veneral disease of the larynx, than a small quantity of blood entered the canal at the moment of inspiration. As its presence prevented the air from passing into the bronchial ramifications, the patient fell insensible. The arteries ceased to beat; a deadly paleness occupied the face; and the whole body was getting cold. Respiration was suspended, and the pulsations of the heart were no longer perceived. Far from being disconcerted by these critical circumstances, the skilful surgeon introduced an elastic tube into the trachea, and, by sucking up the blood and then cautiously inflating the lungs, succeeded in reanimating the patient. Another circumstance not less remarkable in the history of this interesting case

* Lib. cit. p. 89.

is, that the operation was attended with the happiest effect, although delayed till the cerebral circulation was so seriously disturbed that the patient remained for two days afterwards in a state of unconsciousness *.

The following case is instructive in more than one respect.

CASE.

A healthy youth contracted, in the summer of 1830, a venereal complaint, which was imperfectly treated. He was subsequently attacked with pain in the throat, difficult deglutition, hoarseness, and ultimately loss of voice. In the beginning of December the soft palate and uvula were ulcerated, and the tonsils swollen. The patient was at this time suspected to have also ulceration of the larynx. Fumigations of the deuto-chlorate of mercury were employed. After the first fumigation he felt a pricking sensation in the larynx with dryness of the throat. The remedy was nevertheless continued. Forty-eight hours after the first fumigation, dyspnœa and all the symptoms of œdema of the glottis supervened. The patient had been in danger of suffocation four-and-twenty hours when Mr. Roux first saw him; but during his visit no serious symptoms threatened. On the next day, December 14th, the breathing was extremely difficult; and, as the pulse was strong and

* Andral, Clinique Médicale, Tom. II. p. 215.

frequent, venesection was performed. A quarter of an hour afterwards Mr. Roux proceeded to laryngotomy. He had scarcely divided the crico-thyroid membrane before some efforts of expiration were made, and frothy blood was expelled. Suddenly respiration and the action of the heart were suspended; and the patient died, evidently suffocated by the flow of blood into the air passage.

Dissection.—The epiglottis had twice its ordinary thickness, with slight ulceration at its borders, and numerous small vascular growths on its surface. The glottis was œdematous. The membrane of the right vocal cords was ulcerated. The lungs were gorged with blood, and like those of a person suffocated *.

The embarrassment Desault experienced from hemorrhage on the occasion alluded to, led him to decry bronchotomy as an "opération toujours facheuse," and to recommend, in cases requiring an artificial admission of air into the lungs, the irritating and troublesome process of introducing an elastic tube through the nostril into the trachea †.

* Archives Générales de Médicine, Dec. 1831.

† To the many forcible objections adduced by Mr. Porter against the practice of Desault may be added that of the necessity of frequently removing the tube to clear it of the accumulation of mucus, which no efforts of the patient can expel. Even in the much shorter and wider tube which has been used after tracheotomy, this inconvenience has been found to be considerable.

Dr. Cheyne, from an excessive fear of bleeding, has advocated an operation equally reprehensible, namely, that of introducing into the trachea a trocar and canula without any previous incision. "By this means," says Dr. Cheyne, "the hemorrhage, which is productive of such dreadful embarrassment and danger, will be avoided, the operation will be more expeditiously done, and part of the horror of the scene will be avoided." * The reflexion that the canula must irritate by being moved up and down with the larynx, which does not move in association with the skin, combined with the danger of wounding a large blood-vessel irregular in its course †, the œsophagus, or contiguous important parts, and the depth it may be necessary to penetrate in consequence of unusual distance of the trachea from the surface, ought to preclude this use of the trocar. Were tracheotomy required in early life, the comparatively small size of the windpipe at this period would increase the difficulty. And when we read that in one instance a surgeon, who essayed the operation, was obliged to give it up, as he absolutely could not find

* On the Pathology of the Larynx, p. 173.

† Two plates are given in Neubauer's Opera Anatomica Collecta, (Frft. and Lips. 1786,) in which arteries of considerable size are represented ascending perpendicularly in front of the trachea; and various references are made to other unusual distributions, which ought not to be lost sight of in the performance of tracheotomy. See also Meckel's Handbuch der Menschlichen Anatomie (Vol. III. p. 152) for an account of irregular conformation of some cervical vessels which are exposed to injury in tracheotomy.

the trachea!—and that in another instance the carotid artery was wounded, what can we expect to result from this rude proceeding of stabbing the throat?

So far was Casserius from regarding with horror the wound required in bronchotomy, that he attributed to the bleeding thus produced a salutary influence over the disease *. In the case of angina laryngea, the operation, says Richter †, not only removes the most pressing symptom, the difficulty of breathing, and the danger of suffocation, but by the local bleeding which it occasions, greatly contributes to the complete cessation of the inflammatory action. It has been several times observed that the patient has obtained relief as soon as the integuments were divided, and that an hour after the operation he has been able to breathe through the mouth.

As the parts in front of the trachea vary so much in thickness in different persons, and at different times in the same individual, it is expedient to have canulæ of different lengths ‡. It is the depth of the trachea,

* "A cujus vulnere, imo et subsequente hæmorrhagiâ (licet parvâ nec pertimescendâ) operatione portenditur securitas, ægritudini cita curatio."—Casserius de Vocis auditusque Organis Historia Anatomica, Lib. I. cap. 20. fol. Venet. 1609.

† Anfangs-gründe der Wundarzneykunst, Vol. IV. § 331.

‡ "Interim præstaret semper habere tubulos variæ longitudinis, cum quandoque major requiratur tubus, dum partes dissectæ tumentes, postea facerent ut non sufficeret brevior tubus."—Bourlart de Bronchotomia; Collectio Diss. Med. Lovaniensi, Tom. II. p. 177.

which from dissecting the dead body we are not led to expect, that makes the operation extremely difficult in some cases. The trachea of a person labouring under laryngitis was laid bare at full an inch from the surface. "Those", says Dr. Johnson *, "who talk about cutting out a piece of a tracheal ring at the bottom of such a cavity as this, while the trachea itself is in constant motion, and the surrounding muscles ever altering their relative positions in the efforts at respiration, have probably never practised it." In a patient suffering from œdema of the larynx, on whom Mr. M'Namara operated, the trachea was two inches and a half below the surface, to such an extent had serous infiltration of the neck proceeded †. The neck of a labourer, who underwent tracheotomy for cynanche laryngea, was the seat of emphysema. The knife penetrated to the depth of more than an inch and a half before the trachea was exposed; and then it was almost impossible to fix the tube so as to permit the excision of a portion of it ‡.

"I have lately," says Mr. Lizars, "seen three cases of cynanche laryngea in adults, where the muscles on the anterior part of the neck were infiltrated with pus." §

* Med. Chir. Journal, Dec. 1820.

† The Lancet, 1830–31. Vol. I. p. 269.

‡ Case by Mr. Porter, in the fifth volume of the Dublin Hospital Reports.

§ A System of Anatomical Plates, Part IX. p. 26.

Frederick Dekkers's ingenious proposal to introduce a canula into the trachea by means of a trocar, after the preliminary incision of the soft parts, was duly eulogized by that accomplished surgeon, Mr. Louis, who reprobated the advice subsequently given by Dionis *, and approved by Dr. Cheyne. "The idea of Dekkers," says Mr. Louis, "is exceedingly happy. It simplifies the operation, facilitates its execution, and renders it exempt from all inconvenience. The termination of the history of the art will render this truth more striking."†

With a slight modification of Dekkers's instrument,

* "Du temps de Dionis, il étoit possible de mieux dire: il auroit dû etre plus instruit et donner de meilleurs préceptes rélativement aux perfections acquises."—Louis, Mém. de l'Acad. Royale de Chirurgie. Tom. IV. p. 496. 4to.

† The editor of the Journal de Médecine has expressed an equally favourable opinion of Dekkers's operation. "Ce procédé a été modifié diversement par Dionis, Garengeot, Ledran, Bauchot, et autres opérateurs, mais il survivra à toutes ces innovations."—Tom. LXXIV. p. 370. 1821.

The question "An Tracheotomiæ nunc scalpellum nunc trigonus mucro?" is discussed by Bergier in the second volume of Haller's Disputationes Chirurgicæ. The author concludes his discourse in the following words:—"Sunt etiam qui trigoni mucronis usum omnino reprobent; dum enim, inquiunt, magna vi in tracheam mobilem facileque vacillantem adigitur, periculum est, ne aut deviet instrumentum satis crassum, aut posterior cum anteriore lædatur tracheæ paries. Id vero non timuit peritissimus Heisterus; reque ipsâ nullum hujusmodi periculum imminet, modo ne obtusâ acie, aut rudis chirurgi manu, operatio instituatur. Ergo tracheotomiæ nunc scalpellum nunc trigonus mucro."

his mode of operating might, perhaps, in some cases be renewed with advantage. This plan is calculated to obviate the danger of hæmorrhage into the air-passage, and the vexatious and mischievous delay it may cause. Besides, it enables the operator to accomplish his purpose without the assistance of another person. The proposed alteration consists in substituting a curved silver tube for the straight canula, and in having part of the shaft of the trocar formed of conjoined links. Or a sharp pointed knife may be so constructed and fixed to a steel shaft of three or more moveable joints, as to permit the blade to assume the curved form of the canula, and to pass through it easily*. The former appears to me to be the better instrument: the latter might be employed by those who prefer making a simple longitudinal incision of the trachea to a triangular perforation.

The practice of removing a slip of the trachea, recommended by Mr. Lawrence when the canula causes inconvenience, has seemed to me to deserve a more general adoption. I was happy to find my views on this subject corroborated by several respectable authorities.

"After the operation of laryngotomy or tra-

* There is annexed to this paper a lithographic print of the two instruments which were made for me by Mr. Ferguson, surgical instrument maker to St. Bartholomew's Hospital: by which means the reader will have a clearer idea of them than by any verbal description I am able to give.

cheotomy, no person," says Walther, "would think of introducing a pledget into the wound of the windpipe; but a proceeding similar to this, and equally injurious, is generally recommended; I mean the introduction of a canula through which the patient shall breathe, when the operation has been performed, not for the extraction of a foreign body which has entered the air-tube, but on account of interrupted respiration through the rima glottidis. Much trouble has been taken to find out the most suitable form, length, and mode of fastening of such an instrument. But its presence in the wound must operate very prejudicially. It causes violent irritation of the mucous membrane of the air-passage, and spasmodic cough, and increases the danger of inflammation and of its terminating fatally. When a small foreign body has passed into the windpipe, we recognize plainly and determinately the necessity of removing it immediately; and shall we not scruple in the opposite case to introduce purposely a much greater foreign body, which must be far more injurious? The introduction of the canula is unnecessary for the security of freedom of breathing. The patient may breathe very well through the wound, if it be made sufficiently large, and kept open by a suitable apparatus and position of the head."*

Dr. Albers† likewise insists upon the rejection of

* Gräfe and Walther's Journal, Vol. IX., p. 204.

† Ibid. Vol. XV., p. 537.

every kind of canula as well as those recommended by Bell and Richter; as these instruments irritate and give rise to accidents which destroy the object of the operation.

Mr. Carmichael * prefers the removal of a piece of the trachea to the introduction of a canula, because the latter is not only a source of great distress, but is by no means equal to the other for allowing the easy exit of mucus. And Pelletan, whose precepts are generally founded on ample experience, advises that the wound of the trachea should embrace several of its cartilaginous rings, as no inconvenience attends this mode of operating, which secures a free passage for respiration and the excretion of mucus, at the same time that it dispenses with the use of the canula, which would only add to the irritation, even if the patient could endure it †.

Whether the incision include a line or two more or less of cartilage, so long as the opening is made sufficiently large, is a matter of little importance, either as regards the pain or trouble of the operation, or the future closure of the wound.

Perhaps the only reason which authorizes the introduction of the canula, is, that it prevents the flow of blood into the trachea at a time when any addi-

* Trans. of King and Queen's Colleges, Dublin, Vol. III., p. 175.

† Clinique Chirurgicale, Tom. I. p. 31.

tional impediment to breathing might immediately prove fatal. The disadvantages attending its use are so great, that it should be employed as little as possible. So long as the wound bleeds, a metallic or an elastic tube may be useful. But when bleeding has ceased, and the retraction of the soft parts prevents them from obstructing the opening in the trachea, persistance in the use of an artificial tube is unnecessary and injurious. The irritation which the instrument causes, is aggravated by withdrawing and replacing it when obstructed by a concretion of mucus. Besides, the extraneous body must, by irritating the internal membrane, increase that secretion, from an accumulation of which the principal danger is to be apprehended. If the mucous secretion is excessive, and the laryngeal disease prevents its expulsion, suffocation will be as inevitable as though the rima glottidis were hermetically sealed.

The membrane of the windpipe above the wound becomes gradually thickened by the irritation of the canula. This alteration of structure may either obliterate the cavity of the larynx, destroy speech, and render the abandonment of the instrument impracticable, or so far diminish its capacity as to augment the difficulty of speaking, and the danger of closing the wound.

In the Anatomical Museum of St. Bartholomew's are the larynx and trachea of a man who underwent bronchotomy, and wore a tube for several years, till

he died of extensive disease of the lungs. The orifice in the trachea is immediately below the cricoid cartilage. The rima glottidis is much narrowed by thickening of the membrane covering the chordæ vocales. How far the use of the canula may have tended to produce or increase the alteration observed in the larynx, or the pulmonary affection, it is not in my power to determine. Mr. Stanley informed me that the operation gave immediate relief, and that he considered the morbid appearance in the larynx to be the effect of the original disease which had obliged him to operate.

PART III.—WOUNDS OF THE THROAT.

Wounds of the throat deserve to be considered among the causes which give rise to inflammation with swelling and thickening of the laryngeal membrane. The following history is presented to show the necessity of not overlooking, in the treatment of these injuries, the disposition to slow change of structure in the membrane.

CASE.

Thomas Tibbett, aged fourteen, having been detected in thieving, and roughly treated, cut his throat with a razor on the last day of January, 1831, and was immediately brought to St. Bartholomew's. There was a gaping transverse wound of the integuments about two inches in length. The windpipe

was wounded in two places; one incision having been made through the upper part of the thyroid cartilage, and the other through the crico-thyroid membrane. He had lost very little blood, and no vessels required to be tied. The parts were approximated by keeping the head bent forwards, and no attempt was made to unite any part of the wound by ligature. As fluids, which he attempted to swallow, came freely out of the wound, inducing an opinion that the pharynx was injured *, and as deglutition excited cough, and was attended with the inconvenience of separating the severed cartilages, he was fed with milk by the aid of an elastic tube, passed through the nostril: to this operation he quietly submitted, as it was less troublesome than swallowing, and his appetite was keen. At first there was much frothy mucous discharge from the wound, with noisy and sibilant breathing; but the patient suffered little. On the 20th of February he still breathed through the opening, but did not require to be fed, and was able to walk about in the ward. When the prospect of recovery was most favourable, difficulty of breathing supervened. The upper wound of the larynx, which was much the larger one, being sufficient to allow a free entrance of air, the obstruction was considered to be caused by

* That the escape of fluids through a wounded windpipe, during deglutition, is no sure criterion of a breach of structure of the gullet, is proved by two cases of self-murder recorded in the twelfth volume of the Lancet, and by the occasional occurrence of this symptom after the performance of bronchotomy for disease of the larynx.

inflammation lower down in the windpipe, and leeches were accordingly applied. He died on the 27th of February.

The following appearances were found on dissection.

The lateral borders of the epiglottis were approximated; the membrane covering it and the neighbouring parts was swollen, and the glottis much contracted. The upper wound of the larynx would just admit a large bougie. Its communication with the pharynx was nearly obliterated by cicatrization. The lower wound was healed, and scarcely recognizable externally, but clearly indicated within by a wrinkled and indented appearance of the lining membrane. Between the two wounds the chordæ vocales were involved in a fleshy swelling (épaississement par hypertrophie), through which a female catheter passed without difficulty. The tracheal membrane was rather more vascular than usual. There were extensive old adhesions of each pleura, with depositions of gritty and cheesy matter in the lungs and bronchial glands.

This poor boy's life might have been prolonged, had a tube been opportunely introduced through the wound, so as to traverse the seat of obstruction. Tracheotomy, though less eligible, would likewise have effected the purpose. When the larynx is obstructed by the inflammation and swelling which su-

pervene on wounds of this part, Richter * recommends either the placing an artificial tube in the existing aperture, or the performance of tracheotomy. By the latter operation Habicot † saved from suffocation a youth who had a cut of the throat involving the pharynx.

The perusal of single cases of any disease is generally found unsatisfactory; the reader being deprived of the advantage of comparison and induction. Besides, in surgical practice, it is only from an assemblage of undisputed individual histories that general conclusions should be formed. I therefore take the liberty of introducing a few examples, (giving merely an abridgment of the original narrations,) the interest of which appears to me to be increased by connexion with the above account. The first two cases serve to illustrate the acute form of inflammation previously described; and they are the only instances of the kind on record that I am acquainted with. The rest are more analogous to the foregoing history of Tibbett.

CASE ‡.

A workman, aged thirty-six, pursued for debt, and

* Lib. cit. § 333.

† Question Chirurgicale, par laquelle il est démonstré que le chirurgien doit assurément practiquer l'opération de la Bronchotomie, vulgairement dicte Laryngotomie, ou perforation de la fluste ou tuyau du poumon.—Paris, 1620.

‡ This and the next case are translated from the eighth vo-

resolved to finish a life of trouble, cut his throat with a razor between the os hyoides and thyroid cartilage, and was conveyed to the hospital at Toulon on the 30th of December, 1819, four hours after the accident. The lips of the wound were brought together by adhesive straps, and a compress was applied: but ere long hemorrhage ensued, and it was necessary to tie three small arteries. The wound was again dressed, and the head inclined towards the chest. The next day the pulse was excited, but there was no other unfavourable symptom. Blood was taken from the arm, and soothing drinks were prescribed. On the fifth day alarming symptoms suddenly appeared; fits of imminent suffocation, agitation, heat of skin, paleness of the face, tumefaction of the neck, complete loss of voice, hissing and very laborious inspiration, and less difficult expiration. A large bleeding was practised from the arm; fifteen leeches were applied on the neck, and sinapisms on the feet: but the paroxysms increased, and the patient died in the evening.

Examination.—The upper part of the thyroid cartilage had been cut, and the hyo-thyroid membrane divided. There was considerable ecchymosis of the fold of membrane which unites the epiglottis to the arytænoid cartilage of the right side. The membrane of the epiglottis, and of the upper part of the larynx and its ventricles, was œdematous. The serosity was

lume of the Recueil de Mémoires de Médecine, de Chirurgie et de Pharmacie Militaires.

easily expressed from the swollen membrane. The lungs were the seat of a slight sanguineous infiltration.

CASE.

A Swiss soldier made with a knife a triangular wound of his throat, about two inches long, at the upper border of the thyroid cartilage. He was immediately taken to the military hospital at Toulon. There was scarcely any bleeding: the wound was therefore at once dressed with strips of adhesive plaster, and covered with charpie and compresses, which were confined by a circular bandage. The patient was instructed to keep his head bent forwards. In four hours hemorrhage took place. When the dressings were removed, the blood flowed freely, but the bleeding orifices could not be found. A piece of agaric was applied, and the wound dressed (or rather smothered) as before. After an hour the charpie was again soaked in blood; but, as this did not trickle down the neck, the dressings were not disturbed.

A soft blueish swelling now formed at the base of the jaw on the left side. His breathing became very difficult, and the face injected; suffocation menaced; he frequently raised his hands to tear away the dressings. As the bandage seemed too tight, an ordinary chin-cloth was substituted. The wound ceased to bleed, and the patient felt relieved; but he continued restless and agitated, and often assumed

the sitting posture, which seemed to give him ease. The difficulty of breathing soon increased; and he died six or seven hours after his entry into the hospital.

Examination.—The course of the wound was occupied by clots of blood, which had accumulated in the situation of the swelling observed during life. All the cellular tissue of the anterior cervical region was infiltrated with blood, which had come principally from a wound of the laryngeal branch of the right superior thyroid artery. There was considerable œdema of the membrane investing the arytænoid cartilages; and the chink of the glottis was nearly obliterated by the swelling. The veins of the encephalon were more distended than natural; and the lungs were congested.

CASE.*

A young woman, who had divided the larynx just beneath the thyroid cartilage, went on well till the fourth week, when difficulty of breathing came on, and increased during twenty-four hours till death. The cavity of the windpipe above the wound was filled up by "granulations of flesh"†: and when the external

* Wilmer's Observations in Surgery, London, 1779.

† Excrescences, resembling granulations, are often observed in irritated and inflamed mucous membranes. I have seen them of considerable magnitude in a youth's bladder, which had contained a rough calculus. In Egypt, where ophthalmia has so

opening became so small that the lungs could not be supplied with air from that source, a difficulty of

much prevailed, Larrey found pterygium a very common affection, as well as a granular state of the conjunctiva. (Clin. Chirurg. T. I. p. 394.) Morgagni has the history of a man who died suffocated soon after symptoms of affection of the throat were noticed. On examining the larynx, its internal surface presented reddish protuberances, which were like "*inflammata condylomata*," but consisted of the mucous membrane and its glands swollen from increased vascularity and interstitial serous effusion. (De Sed. et Caus. Morb.) When hypertrophy of the membrane of the windpipe is confined to a circumscribed point, it may give rise to tumours which project more or less considerably above the level of the rest of the mucous lining: these have a large base, and are more common in the larynx than in other parts of the air-tube. Andral mentions another form of hypertrophy, which affects the mucous follicles, and causes a peculiar granulated appearance of the laryngeal membrane. Warts, and growths like certain syphilitic cauliflower excrescences, are sometimes met with in the larynx. There are three specimens of this kind in the Museum at Guy's Hospital, and a very fine one in the Hunterian collection. Dr. Albers has described, under the title of Polypus of the Larynx, tumours which were firm and fleshy. Two such cases were seen by Desault, and a third is mentioned in his works. In all three the tumour was pyriform, with its pedicle inserted into one of the ventricles. Pelletan tells us of a man who was suddenly suffocated by a firm and undulating tumour of the size and shape of a small nut, blocking up the air-passage. It was attached in the neighbourhood of the glottis by a longish pedicle. A similar case was seen by Dupuytren. The patient was subject to fits of dyspnœa, for which no cause could be assigned, and during one of them he suddenly died. Unfortunately, when such tumours are formed within the larynx, we can only ascertain their existence by dissection. The patient might easily be completely relieved, were the cause of his symptoms recognisable during life.

breathing commenced, and at length the patient was suffocated by the very efforts which nature made to heal the divided parts.

CASE.*

A young Savoyard had his throat cut transversely with a knife by a comrade who attempted to rob him. The trachea and œsophagus were wounded. The progress towards recovery was remarkably favourable.

In fifteen days the false passage of fluids in swallowing had ceased; and in six weeks the whole wound was cicatrized. When considered cured, but still kept in the hospital, he was visited in bed by a commissary, who came to confront him with his assassin. The lad arose with promptitude and emotion, and fell dead at three steps from his bed. The examination of the body disclosed a remarkable contraction with swelling of the mucous membrane opposite to the cicatrized wound of the trachea. The cicatrix of the œsophagus was confounded with that of the surrounding parts. No other internal lesion was discovered.

Sir Charles Bell relates the case of a little girl on whom he operated to extract a plum-stone from her windpipe. For some time after the operation he was very anxious for the child's life. The reason of this anxiety was founded on the following circumstances.

* Pelletan, lib. cit. p. 38.

A woman, in phrensy, plunged a penknife into her throat. It pierced the thyroid cartilage at the union of the chordæ vocales. She was suffocated at the end of some months by the granulations which filled up the passage of the glottis.

Another woman drew a penknife down her neck, and divided five rings of the trachea. She survived the first effects of this wound, but was suffocated by the retraction of the cut edges of the cartilages, and the swelling of the inner membrane, which diminished the capacity of the tube. These instances of death by suffocation reminded the author of the necessity of performing bronchotomy on some of those who have cut their throats, as well as in some cases where suicide has been attempted by firing a pistol into the mouth *.

A patient, suffering from laryngitis, underwent laryngotomy in the Glasgow Royal Infirmary on the 6th of March, 1828. The disease had to all appearances subsided, and the wound healed. On the 30th rigors and violent orthopnœa came on suddenly. Immediate relief was afforded by opening the cicatrix of the former wound. He was dismissed from the hospital quite recovered on the 4th of June †.

* Surgical Observations, Part I. p. 44. See also a Clinical Lecture by Sir C. Bell, on the performance of Laryngotomy, in the fifth volume of the London Medical Gazette, 1829–30.

† London Medical and Surgical Journal, December, 1828.

In the Medico-Chirurgical Review, (July 1831,) a remarkable case is related of a wound of the trachea, followed by closure of the larynx and aerial fistula. Breathing became difficult as the external wound healed; and the unhappy man at length suffered so much, that he pushed a knife through the cicatrix. Dyspnœa recurred as the wound again healed. The patient, therefore, constructed and introduced a leaden tube, which enabled him to breathe easily. He died six years afterwards of phthisis, after experiencing repeated attacks of bronchitis. The obliteration of the air-passage was found, on dissection, to be complete where the trachea joins the larynx.

Professor Lüders has published an account of a suicidal attempt, in which the trachea and œsophagus were cut through. Difficulty of breathing was produced as the opening in the trachea became narrowed by granulations: these were at first pushed aside, and kept down by caustic: but to prevent suffocation, it was at length necessary to introduce an artificial tube, which the patient continued to wear when seen two years afterwards*.

In the case of a young woman who had divided the crico-thyroid ligament, in attempting suicide, and had afterwards worn a silver canula through the wound, Mr. Liston was enabled, by gradual dilatation of the glottis by bougies and elastic tubes, to restore it from a nearly complete state of obliteration

* Gräfe and Walther's Journal, Vol. XIII.

to its normal diameter, and eventually to close the wound, and re-establish natural breathing. The patient also slowly recovered her voice*. The treatment adopted by this ingenious surgeon was attended with serious inconveniences and considerable danger; but the remarkable success which he obtained, justified the proceedings, and proves how much may be done in these cases by skilful management.

In some of the cases above cited, as well as in that of Tibbett, life might have been prolonged by surgical interference; and the unfavourable termination may be ascribed, in a considerable measure, to the circumstance of the wound being so near to the chordæ vocales. When the membrane investing these ligaments is long irritated, it is gradually consolidated and thickened. If the irritation be great and sudden, a more rapid inflammatory swelling speedily causes suffocation. The disposition to these changes of structure deserves consideration, in estimating the comparative merits of tracheotomy and laryngotomy. The case of the Savoyard, and one quoted from Sir Charles Bell, show that, even in a part of the windpipe least liable to such swelling of the internal membrane as shall intercept the passage of air, this accident may still destroy life.

As no observations on wounds of the throat have appeared in the Transactions of the Society; and as these alarming accidents occur frequently, and some

* Edinburgh Medical and Surgical Journal, January, 1828.

difference of opinion exists respecting the best mode of treating them, the present may not be deemed an improper occasion to invite attention to the experience of Dr. Rust on this subject. The three following cases are recorded in his monograph on wounds of the windpipe and gullet, published at Vienna in 1815*; and they are here cited, not so much for the sake of the cases themselves, as for the reflections with which the author concludes them, and which I shall set down in his own words.

CASE.

A servant, aged twenty-one, of weak constitution, was induced, through the treacherous conduct of her lover, who had already made her a mother, in despair and weariness of life, to adopt the culpable resolution of destroying herself. On the eve of the 1st of January, 1815, this broken-hearted girl retired to bed provided with a razor; and when all was quiet, and the light extinguished, she proceeded to perpetrate her intention. A fellow-servant, who slept in the same room, was first aroused about four o'clock in the morning by her noisy rattling breathing. When a light was brought, and the master of the house came to assist, she was insensible, and deluged in blood. The surgeon, who was called in, finding the windpipe completely cut through, de-

* Beobachtungen über die Wunden der Luft—und Speiseröhre, Wien, 1815.

clared that she could not live, and sent her to the Vienna General Hospital, where Dr. Rust saw her at nine a. m.

The whole surface of the body was death-like pale, and the countenance had all the aspect of a dying person. The brow was covered with cold sweat, and the eyes had lost their lustre. The extremities were cold and pulseless; and the existence of life could only be inferred from the indistinct action of the heart, the occasional murmuring respiratory efforts, and the more frequent convulsive movements. The wide gaping wound, gorged with clotted blood, penetrated between the thyroid and cricoid cartilages, and through the anterior wall of the pharynx; so that when the coagulum was removed, the finger could be introduced into the œsophagus. The severed windpipe was drawn considerably downwards, and was apparent only during the coughing, produced by the examination of the wound. The divided vessels had retracted, and the bleeding almost entirely ceased.

After the cut surfaces of the windpipe were united by a single loop, and those of the integuments by the interrupted suture, the head was bandaged, and inclined forwards; and the limbs were rubbed, and enveloped in hot cloths. The patient soon began to revive: respiration became more regular: warmth and pulsation returned in the extremities, but with them hemorrhage from the wound, and threatening suffo-

cative cough. The bandage and sutures were immediately removed, and two blood-vessels tied. Fainting was re-produced, from which she soon recovered, when the parts were adjusted as before. To prevent the recurrence of hemorrhage, cold damp cloths were applied on the throat. After a few hours, perfect consciousness was restored, and every thing appeared favourable. She now attempted to tear off the bandages, and to finish her suicidal design; but through the persuasion of Dr. Rust, and the interposition of a priest, she was conducted to a knowledge of her duty sooner than was expected.

Jan. 2d. The pulse small and feeble; respiration tolerably easy. She suffered from excessive thirst, which she could not appease, as every attempt to drink produced violent cough. Evacuations were procured by clysters; and the large intestine was replenished by injections of meat-broth with yolk of eggs. The thirst was diminished by the use of a warm bath.

4th. Respiration hurried; the pulse excited; pain in the wound and windpipe; oppression of the chest, and slight dry cough. A blister was applied on the nape, and twelve grains of calomel were taken in divided doses. Instead of the cold cloths, warm fomentations were employed. The clysters were continued. Towards evening menstruation appeared.

5th. A remarkable remission of all the symptoms.

The calomel was repeated, and a little mucilaginous drink was swallowed without much trouble, when she attempted a very small quantity each time. A greedy effort was immediately followed by cough and escape of the liquid through the wound.

6th. Symptoms of salivation appeared. As the bowels were confined, an injection of senna and Epsom-salt was administered with good effect.

7th. Nutritious clysters were used; no medicine was taken.

8th. All the feverish symptoms returned with increased violence, and troublesome dry cough. The pulse was small, but had a peculiar hardness. Notwithstanding the previous hemorrhage, and the menstruation which had just ended, Dr. Rust directed the loss of eight ounces of blood from the arm, which gave immediate relief. An oily emulsion, with a small quantity of the extract of henbane, was also ordered.

9th. The fever was moderated, and the salivation less. A blister was placed between the shoulders. The costive state of the bowels was relieved by a strong purgative injection. The emulsion was continued; and, as the patient daily swallowed better, she was principally nourished with thin broth taken by the mouth. Dr. Rust now removed the sutures, and the noose that united the larynx, but kept the head fixed forwards.

11th. She was again feverish, coughed incessantly, and despaired of recovery. Six leeches were applied in front of the larynx: the bowels were freely acted upon, and the dose of hyoscyamus was increased: but no marked relief followed.

13th. Fluctuation was perceptible beneath the united skin wound: this was opened: a quantity of purulent matter, with mucus, escaped; and the alarming symptoms at once disappeared.

14th. When taking her broth, some of it still came through the opening: her strength was considerably improved: it was consequently determined to introduce nourishment for a few days solely by clysters. This had so good an effect, that on the seventeenth the wound was again cicatrized.

At the end of January the patient could swallow well; but she had hectic fever, with cough and puriform expectoration. These symptoms were removed by the insertion of two issues in the upper arms, and the use of digitalis, Dover's powder, bark, &c.

She left the hospital on the 20th of March, being hoarse, but in all other respects well.

CASE.

J. A. a distressed tradesman, forty years of age, cut his throat with a pocket-knife on the 12th of

April, 1814. The wound, three inches long, penetrated through the larynx and corresponding anterior part of the alimentary tube, dividing the thyroid cartilage obliquely from its left upper cornu towards the right lower cornu. When brought to the hospital he was considered dead, and no measures were adopted. Three hours afterwards Dr. Rust found the man cold, and apparently lifeless; yet he deemed it his duty to unite the wound by sutures, and fix the head in a proper position. In less than half an hour the supposed deceased began to breathe. Some cordial drink was administered; but the greater part of it escaped through the wound, and violent cough was excited. The next day the patient was greatly recovered, but he could not swallow. He was afterwards much oppressed, and occasionally experienced a suffocative fit. Nutritious fluids were injected into the lower bowel, and baths were used to mitigate his thirst. Notwithstanding he had lost much blood, Dr. Rust was twice obliged to order venesection and leeches, to subdue the inflammatory disturbance. Large doses of calomel alone, and afterwards in conjunction with the extract of hyoscyamus, small doses of camphor, and lastly the cinchona, contributed to the patient's recovery. In this instance, also, a mucopurulent formation took place beneath the cicatrized integuments; but it opened without surgical assistance, and left a sloughy ulceration, which soon improved under simple treatment. On the 19th of May the ulcer was still open, but the patient was so far restored, that he deceived the attendants, and

escaped over the high hospital wall. He was brought back on the same day, and remained in the hospital until the 29th of May, when, being completely recovered, he again absconded to avoid the police.

CASE.

A. K. a joiner, 25 years of age, had a fit of insanity on the 8th of February, 1814, according to his own expression, on account of vexations with his fellow-workman, and thwarted love: during this he left his home, passed the night astray, wandered about the fields the next morning, and, at length, disgusted with life, cut his throat with a razor, which he had reserved for the purpose. Having repented of the deed, he retired into the nearest shed, where he remained cold and concealed till the following morning, when he resolved to go back to Vienna, but sunk exhausted on the way. He was brought to the general hospital late the same evening. The wound, four inches long, penetrated through the thyroid cartilage into the pharynx: and it appeared inconceivable how life had been preserved, and how the large blood-vessels had escaped uninjured. The condition of the neck, and the dried blood on the patient's shirt, showed that the wound had existed at least 24 or 36 hours. Dr. Rust united the edges of the divided integument by four or five sutures, and fixed the head forwards. The patient soon recovered from the faint state in which he was on his arrival at the hospital. He

could now speak a little, and swallow so well that doubts arose whether the gullet was actually wounded. He was troubled almost incessantly with cough. Besides the usual emollient remedies, calomel and opium were administered: but as the pulse was feeble, and as the symptoms were rather nervous than inflammatory, venesection was not employed. The patient was flighty and restless. In a fit of rage and desperation, on the fifth day after his admission, he tore off the bandages and loosened the sutures. The wound assumed a sloughy aspect. He lived until the 20th of February, and might perchance have been restored, as later experience authorized Dr. Rust to believe, if in the commencement, without regard to the state of the pulse and the loss of blood, the antiphlogistic plan had been pursued, so as to have entirely prevented inflammation of the air passages and lungs.

A judicial examination of the corpse was instituted. The larynx and pharynx were found completely divided.

" The principal danger of such wounds is to be sought in the subsequent inflammation of the windpipe and lungs. Large doses of calomel, friction of mercurial ointment on the neighbouring parts, cold lotion to the neck, active local as well as general bleeding,— in a word, the reduction of life to its lowest pitch are the most certain means to prevent this fatal inflammation. I was never fortunate enough to save

any one thus wounded, unless where the powers had been almost exhausted by the accidental or prescribed loss of blood. All injuries of this sort have proved fatal when immediate assistance was afforded; and usually the quicker, as the loss of blood was smaller and the patient's strength promised a longer duration of life. Of the latter class several unfortunate sufferers have died, when the windpipe has only been partially divided: whereas I have this day, in the hospital, perfected the cure of such a patient, even under the persistance of symptoms threatening danger, by means of venesection for three consecutive days, so as to produce fainting each time, together with leeches on the neck, large doses of calomel, and a spare diet.

"The uniting of the divided windpipe by suture is not so essential as the ancients supposed, nor so objectionable as modern writers represent. Here, as in general, the middle way is the best, and a single loop appears as necessary in many cases to prevent the descent of the lower portion of the tube, as the employment of three or four sutures is superfluous and prejudicial.

"Further observations and experiments must determine whether, as the above cases seem to teach, it is better, instead of immediately closing by sutures the external wound, to keep it open either totally or at least partially, until the wound of the windpipe

and other deep parts is healed, so as to allow free vent for any accumulation of pus or mucus."

To this important practical comment I may be allowed to add a few remarks.

In the state of faintness or asphyxia, in which persons are often found after cutting their throats, they are not unfrequently supposed to be dead, and are consequently neglected even by those who ought to judge better *. I have seen a surgeon make a very awkward appearance before a coroner's jury in consequence of this mistake. However desperate the condition of a wounded person may seem, we should in no instance omit the necessary exertions to restore him.

When the windpipe is not divided in a wound of the throat, yet inflammation occurs, the passage for the air is likely to be precluded, and the patient thereby suffocated. This was exemplified in the case of the Swiss soldier. I know no better rule of conduct under these circumstances than that laid down by Dr. Turner in his Art of Surgery. "You are to

* Sabatier justly condemns Lamotte (Traité Complet de Chirurgie, Tom. I. p. 733, Paris 1771,) for suffering a man who had received a wound of the windpipe and œsophagus to be left entirely to nature when a chance of recovery existed. This patient survived the injury three days, and might in the opinion of Sabatier have been restored. A remarkable instance of the same oversight is recorded by Mr. Serre. (Traité de la Réunion immédiate, p. 267, Paris 1830.)

proceed," he says, "as in the true *Angina*, not only making all possible revulsion by bleeding, blistering, cupping, sharp clysters; but according to some, and that very rationally grounded, (yet I think very seldom put in execution,) with your knife to divide carefully the membrane between the *rimulæ*, or rings of the air-pipe, and introducing a canula below the part obstructed, which is to be there continued until the symptoms remit, and respiration is carried on as before, when the pipe may be taken away, and the wound admitted to heal."*

When the trachea is divided, there is no chance of union by the first intention. For what purpose then are these patients endangered by the employment of sutures? I here allude to the custom of closing the wound by bringing together with stitches the cut surfaces of the integument. If there is a complete division of the windpipe, produced by a simple incision across the throat, unless the lower portion of this canal be prevented from sinking by some means which shall approximate it to the upper portion, the skin is apt to turn inwards, and obstruct the passage by which the air enters. It is true, that in this instance, an additional incision through the skin and subjacent soft parts (commencing at the first cut so as to join it at right angles, and extending along the middle line of the neck towards the sternum to a greater or less extent, according to the degree of sinking of the lower segment of the air-tube,) would

* Vol. I. p. 437. London 1741.

prevent them from overlapping the opening, which it is essential to keep clear. But this operation must increase the ugly appearance of the accident, and the subsequent deformity: and, although the use of sutures to maintain in apposition the deep seated parts, is an objectionable proceeding, if it were capable of answering the same purpose, I would rather adopt it than enlarge the wound.

Ambrose Paré relates the following memorable example of the ill effects of stitching the integuments.

A pastry-cook, who had received a sword-cut of the trachea, had the lips of the wound united by suture. Soon afterwards air insinuated itself into the cellular membrane, and distended the whole body. The face was so inflated that no appearance either of eyes or nose could be perceived. As the pulse could not be felt, he was considered to be more in want of a priest than a surgeon, and extreme unction was administered. The patient was restored by many deep scarifications, which allowed the air to escape.

In a more recent and unfortunate instance emphysema of the upper part of the body occurred to an enormous extent, in consequence of closing the opening in the integuments.

This, however, is not the most formidable result of the use of the needle. In the event of secondary hemorrhage, which, as the preceding histories teach

us, is not uncommon, suffocation may occur from the want of a proper outlet for the blood, and its consequent passage into the air-tubes. Boyer is correct in saying, that in wounds of the windpipe less danger is to be apprehended from the quantity of blood the patient loses, than from the passage of this fluid into the canal. This accident proved fatal to a patient in St. Bartholomew's Hospital*. It also caused the death of a young woman whose assassination created a considerable sensation in Germany; some difference of opinion having been entertained respecting the case, when the question was referred to the medico-legal authorities of Gottingen, Whether the wound was *necessarily* fatal? These learned gentlemen, in the heat of their discussion, seem to have entirely overlooked that class of events which is designated by the older writers *Lethalitas per accidens.* For "wounds," says Heister, "become mortal by accident, either by the ill conduct of the patient himself, or by the ignorance or neglect of his surgeon." "The accused person ought to be acquitted, and the surgeon indicted."

CASE†.

Henrietta Hornbostel, a maid-servant, aged twenty, received a razor wound of the throat on the 17th of June, 1828, at eleven p. m. Four hours elapsed before medical assistance was obtained; and she had

* See the Lancet, Vol. VII. p. 223, 1825; and Vol. I. p. 764, 1828—9.

† Rust's Magazine, Vol. XXVIII., p. 322. 1829.

then lost a considerable quantity of blood. The surgeon found her breathing with a loud rattling noise. The wound extended across the neck, completely dividing the thyroid cartilage at its middle part, and penetrating the gullet. The superior segment of the larynx was drawn considerably upwards. The inferior portion was sunk deeply towards the sternum; but it ascended into view occasionally during certain muscular efforts. The right external jugular vein was wounded: and, as this vessel continued to bleed as often as the patient moved her neck, it was tied. The cut surfaces of the windpipe were approximated by sutures, which were passed through the tissues immediately in front of the cartilage, but not through the cartilage itself. The wound of the integuments was united by seven sutures and sticking plaster. The head was maintained in a suitable position by a bandage. Air no longer escaped through the wound, and speech was rendered audible; but fits of violent cough supervened, attended with a frothy bloody expectoration. At half past six a. m. there was great restlessness, with difficulty of breathing, a full and hard pulse, and hot skin. A small quantity of blood was therefore taken from the arm. Death took place about an hour subsequently, after an attack of suffocative cough.

Inspection after death.—The wound was united by sutures. It was four and a half inches long, and two inches deep. The thyroid cartilage was completely cut through at its middle part; and one-third

of the circumference of the pharynx was divided. Excepting the right jugular vein, which was tied, no important vessel or nerve was injured. The windpipe was filled with frothy blood, which had passed far down into the bronchial tubes. The right ventricle of the heart was full of coagulated blood. The full state of the cerebral and abdominal vessels gave no indication of hemorrhage.

In the preface to his "Discourses on the Nature and Cure of Wounds," Mr. John Bell has opposed, with his usual acuteness, the inclination for doing every thing by main force of surgery; and has endeavoured to inspire surgeons with a just and rational reliance on the provisions of nature for the cure of injuries and diseases. But, in his sixth discourse, this excellent doctrine is totally forgotten by the writer; who, although he repeatedly ridicules the excessive care of another author, for stating, "that in a wounded intestine he would not leave even the smallest opening that could admit either chyle or fæces to pass, without stitching it up,"—himself recommends, when the throat is wounded, "to get the parts into fair and neat contact so that not a particle of food nor of foam should escape. The continual draining of the saliva cannot be prevented otherwise than by closing the wound neatly and effectually: it should be closed with a number of separate stitches proportioned to the extent of the wound. The stitches should be neat and firm, through the skin and muscles,—through all the flesh that can fairly be

got at, but not through the cartilages. In the interstices of the stitches, should be laid neat slips of black court-plaster, across the lips of the wound: a large flat adhesive plaster should be laid over all to make it firm."

It is necessary to protest against this mode of treatment, since it has been thought worthy of recommendation in some respectable modern works. A French surgeon, who flourished two centuries ago, well observed of a wound of the windpipe, "Labia vulneris inter se junguntur perpetuâ capitis versus sternum inclinatione ac depressione, quæ instar vinculi est et suturæ."*

An interesting history of a patient, aged 55, who divided with a razor the hyo-laryngeal membrane and the anterior wall of the pharynx, is given in the second volume of Loder's Journal. The narrator very correctly attributes the successful result to the judicious treatment employed, and the absence of sutures and unskilful interference with nature.

A grenadier inflicted on himself a severe wound of the larynx and gullet. The integuments were stitched: bandages were applied. In a few days an inflammatory swelling appeared above the sternum; and its formation was attended with dangerous symptoms of suffocation. When pressure was made

* Renati Moreau epistola: extat in opere Thomæ Bartholini de Angina Puerorum, 1646.

on this swelling, a foul puriform secretion with clots of blood escaped from the wound. The surgeon immediately loosened the bandages, laid open the wound, made an incision through the integuments below, and let out a quantity of stinking bloody matter. Relief soon followed, and the patient got well *.

Walther † relates an instance of attempted suicide, in which the membrana thyreo-hyoidea was divided with a razor. The larynx was depressed, and all nourishment escaped through the wound. The patient at length found a means of placing his head, which enabled him to take food. He got well rapidly without the use of sutures or plasters.

Schneider ‡ saw a case in which the windpipe was completely divided, and the gullet wounded. No sutures were employed, and the cure was effected in sixteen days.

M. Fine has given an account of a madman who drew a penknife in several directions through the thyroid cartilage, and wounded the pharynx. The means first adopted to prevent the escape of air through the wound, and to promote its union, occasioned so much distress, that they were soon aban-

* Schmucker's Vermischte Chirurgische Schriften, Vol. III. p. 175. Ed. 2.

† Med. Chir. Zeitung, 1816. Vol. II. p. 29.

‡ Allgemeine Med. Annal. Jahrg. 1818, H. 3.

doned. The healing process went on uninterruptedly and most favourably when the surgeon was content to follow the simple ways of nature. This case led M. Fine to make the following sensible remark: "As the nature of these wounds varies to so great an extent, the means suited to those which are simple, may sometimes be very prejudicial to those which are complicated; such, for instance, as the bending of the head forwards upon the chest, the uniting bandages, the adhesive plasters, and the attempts to keep the edges of the wound in coaptation: for these means, by opposing the escape of blood or mucus from the larynx, as well as the passage of air through the wound, render breathing very laborious, and thus give rise to congestion of the vessels of the brain and lungs."*

Respecting the advantages which accrue from a considerable and immediate loss of blood after the infliction of these injuries, very opposite sentiments have been expressed by experienced surgeons. It is an opinion held by some, that when persons have bled freely at the time of an accident, or at an operation, inflammation is less likely to supervene. It has been remarked on the other side, that hemorrhage is usually succeeded by a stage of reaction, which will often terminate in inflammation; and that under such circumstances, inflammation is more difficultly contended with, from the previous reduction

* Journal de Médecine, Chirurgie, Pharmacie, &c. Tom. 83, p. 73. 1790.

of the patient's powers; but that, when blood is removed at the onset of inflammation, no such reaction takes place. All the experience that I have had, tends to convince me of the accuracy of Dr. Rust's opinion, and of the fallacy of the observation of those who have regarded this subject in the opposite point of view. I have, generally speaking, found that in all wounds, whether accidental or intentional, recovery is more certain, and is sooner and more satisfactorily effected, whenever much blood has been lost at the onset; and I have so repeatedly witnessed the good effects of this early depletion, that I nearly always hesitate to stop the bleeding of a recent wound. No practice in surgery is, in my opinion, more injurious than the common one, in the treatment of compound fractures, of immediately covering the opening in the integuments, and thus preventing the free discharge of blood. The danger of reaction above alluded to, is not unfrequently produced by the stimulants which officious friends and injudicious surgeons are apt to administer to fainting patients. Where this pernicious practice is avoided, and the loss of blood is ample, the stage of reaction, as far as my experience goes, presents nothing formidable either in itself or in its consequences.

CASE

OF

EXTENSIVE

OVARIAN DISEASE,

COMPLICATED

WITH PREGNANCY.

BY THOMAS HEWLETT, ESQ.

SURGEON, HARROW ON THE HIEL.

COMMUNICATED BY DR. LOCOCK.

READ 27TH MARCH, 1832.

On the morning of the 25th of August I received a hasty message to see Mrs. ——, who was said to be taken with premature labour. On arriving at her house, I found the lady (who was in her thirty-fifth year, and had borne six children) had just entered the seventh month of pregnancy, and was suffering considerable uterine pain, frequent in its return, the intervals of ease being about two or three hours. An examination per vaginam discovered what I at first thought was the head of a fœtus, low down in the pelvis, occupying the hollow of the sacrum behind, and allowing little more than a finger to pass between it and the pubis before; the presenting part appearing to be the vertex. I could not however feel the os uteri, and the finger was withdrawn, unmarked by discharge of any kind. The pulse was

full and quick. I enjoined the recumbent posture with quietude, drew away sixteen ounces of blood from the arm, and prescribed a mixture containing small doses of the extr. conii with magnes. sulphatis. The strict observance of this plan, quieted the pains for three days, when they returned with some violence. I again examined, on the 29th and 30th, and being still unable to discover any os uteri, I left my patient with an impression, that it was either one of those cases of partial retroversion so well described by Dr. Merriman, or that the tumour, which I at first took for the head, was really an impacted ovary. The pains, which still bore a uterine character, were now controlled only by opiates; and from their frequent and regular return, I apprehended labour was speedily coming on; and as the patient lived at the distance of three miles from me I slept at her house for three or four nights. At this period, the patient being harassed by fruitless pain, and worn from want of rest, the constitution also beginning to shew evidence of the effect of irritation, by the frequent presence of sickness, and a general febrile tendency, my opinion too being undecided as to the state of the presentation, I requested another opinion, and on the 21st of September Dr. Locock was sent for. After a very patient and careful examination per vaginam, he thought he could reach a *segment* of the os uteri high up above the pubis. With regard to the swelling, we both agreed that it bore more resemblance to an ovarian tumour than what I at first thought it was, viz. a partially retro-

verted uterus. On passing the hand over the abdomen, the boundary of the womb could be distinctly traced; and in the left hypochondriac region, distinct from the uterus, a hard unyielding substance, apparently floating in fluid, could be plainly felt. This Dr. Locock at once pronounced ovarian. The legs were exceedingly œdematous, particularly the left. Dr. L. advised the free exhibition of saline purgatives, enjoined quietude, and the continuance of the opiate. The patient felt considerable relief by the free discharges from the bowels; the distension of the abdomen and legs was for a few days much diminished, and altogether her state was more comfortable. The relief was, however, but transient; the swelling of the labia and legs, and the pain arising from the tightened state of the skin proving a great source of uneasiness, I punctured both the legs and labia, which latter were enormously distended, and very much ease was obtained by the *large* discharge of water from these parts.

The symptoms continued much the same until the 6th of October, when, in addition to the other discomforts of the patient, there were difficulty and pain in passing water which called for the frequent introduction of the catheter. On the above day the pains returned with frequency, regularity, and force, but no os uteri could be discovered, although I made frequent and careful examination; neither was there any show. Towards the morning of the 7th, the pains increasing, Dr. Locock was

again sent for, and was requested by the patient's friends to bring Dr. Merriman with him. On their arrival Dr. M. examined the patient, and with some difficulty reached what he also believed to be a *part* of the os uteri, the extremity of the finger bringing with it a very small quantity of a dirty-looking secretion. He was on the whole inclined to think the case one of partial retroversion, but gave a guarded opinion about it, as his mind was divided between this and the presence of an ovarian tumour. He thought it advisable to endeavour to get the patient on to her full period, she being then in the first week of the ninth month, believing it probable, that if the mouth of the womb was at all tilted upwards, it would perhaps right itself then. He recommended a continuance of the opiates, and such a light nutritious diet as was calculated to keep up the patient's strength.

It was now pretty evident that the system was feeling severely the effect of such long continued suffering. The sickness which had for some weeks past greatly distressed her, was controlled neither by light cordials nor strong stimulants, and the hydrocyanic acid, or the constant exhibition of effervescing draughts, were equally ineffectual in suppressing it; the breathing was also much oppressed, and the legs and thighs much distended; the movement of the fœtus was languid, and ceased entirely, as far as the mother's recognition of it could discover, altogether on the 8th.

On this day, the 8th, the patient had for the first time, a slight discharge, very sparing in quantity, and exactly resembling in colour the secretion that appeared on Dr. Merriman's finger; this continued during the 9th and 10th, and on the 11th the napkin was stained with a bright yellow, in appearance resembling pus. An examination, however, detected no alteration in the state of the parts; there was the same unyielding tumour low down in the pelvis, firmly bound down, and being as it were continuous with the rectum, protruding nearly to the os pubis, and scarcely admitting a finger to pass between it and that bone; beyond it at this part I repeatedly and anxiously felt for the os uteri, but in vain. It did, however, appear both to Dr. L. at his last examination, and to myself, that by firm pressure upwards, the tumour could be very slightly raised, but with pain to the patient. Towards the evening of the 11th the pains were recurring with great regularity, and some force, every ten minutes; and I determined to stay with Mrs. —— during the night, but towards one or two in the morning they wholly ceased; and by the assistance of an opiate she got some hours' sleep, awakening refreshed and strengthened. At about seven on the following morning (the 12th) a large discharge of dirty-looking water (liq. amnii) took place without the occurrence of pain. As soon after the discharge of the waters as possible I again examined, but found nothing to cheer me as to the event of the case, the parts being

exactly as they were previously to this occurrence. The system, however, seemed recruited by the few hours' sleep obtained during the preceding night, and the day passed over in quietude; the patient taking and retaining light nourishment, and not betraying any symptom of sinking.

At my evening visit, at 10 o'clock, I found her suffering from the return of uterine pain, which had commenced about an hour previous, and which by one in the morning of the 13th had assumed the regular grinding pain of labour, being confined chiefly to the back. The pains continuing to increase in frequency and severity, I examined with care, at 2, 3, and 4 o'clock, but was still unable to reach the os uteri or any other part of the womb. I now felt satisfied of what my fears had all along led me to apprehend, that there was no hope for my poor patient, but such as the Cæsarian section afforded; and as I did not feel justified in submitting her to this most serious and generally fatal operation without the sanction and in the presence of some other opinion, I requested Drs. Merriman and Locock might be again sent for. The latter gentleman only arrived, the former being from home.

The pains were now frequent and tormenting, being confined principally to the anterior part of the womb, the pulse small and quick, the countenance sunk, and the general aspect of the patient bad. Dr. L. arrived at a little after seven and I had examined Mrs. —— at SEVEN. I lay

particular stress on this fact, because it will be presently seen that it is important. At this hour there was not, to my mind, the smallest alteration of parts, the same absence of os uteri, the opposing tumour unmoved, and there was a slight discharge of mucus of a dirty colour. I stated the apparently hopeless situation of our patient, as far as the natural efforts could assist her, to Dr. L. in an ante-room; and while debating on the *least* dangerous course to be pursued, and about half an hour after I had last examined her, a pain of a wholly different character for the first time occurred, recognised not by the finger, but by the ear. Dr. L. requested me to introduce the catheter before he examined her. On each former occasion, on which I had done this for her, I had had little difficulty, but now there appeared an impediment to the entrance of the instrument into the bladder which had not existed a few hours before, and for which I could not at the moment very readily account. I did however, after some time, succeed, and drew off about two ounces of urine; during this trifling operation, another pain, similar in character to the last, occurred. Dr. L. then came into the room and immediately introduced the finger, when to our great delight he announced that the head was fast descending, and the scalp, having more the feeling and elasticity of a distended bladder than the covering of the head, was making rapid progress towards its exit. It will readily be believed with what unmixed pleasure we received this information, and with what increased admiration we viewed the resources of nature, at this "her

eleventh hour." Dr. L.'s examination took place at eight, so that this improvement in the state of the parts must have been effected in less than an hour. The tumour was pushed on one side, or perhaps flattened. The head continued to descend; and just before its expulsion, it so much resembled a distended bladder, that for a moment I doubted whether it was the scalp that I touched; the presence of hair convinced me of the fact. The fœtus was expelled at 10 o'clock, the placenta following immediately afterwards; the child was quite putrid, the bones of the head being entirely separated and broken up, and to this circumstance alone can be attributed the salvation of the patient from an operation fearful in itself to her, and too frequently fatal to warrant its ever being undertaken but from the most imperative necessity. An examination immediately after the expulsion of the placenta discovered the tumour on the *right* side, precisely in the same situation as before delivery. The left ovarian tumour also, surrounded by fluid, could be more distinctly felt, and was found to have descended in the abdomen.

Nothing unusual occurred after delivery, and at one I left her with a reasonable hope of her doing well. My evening visit, however, dispelled this grateful expectation, for I found the abdomen as large, if not indeed larger, than before delivery. On examination it was evident that part of the distension arose from an accumulation of fluid; but the greater part was produced by the presence of a large tumour occupying the whole of the left side of the abdomen; not tender to

the touch, nor causing further inconvenience to the patient than that arising from its bulk. It appeared to me that the fluid was contained in an ovarian cyst of the left side. Subsequent events, however, proved this opinion to be incorrect. The patient had had a few hours' sleep, and retained light nourishment, and appeared, as far as constitutional symptoms indicated, going on well. On the 14th, the bowels not having been relieved, a purgative was given, and a saline fever draught was taken every four hours. The chloride lotion was also used to correct the offensive odour of the lochial discharge.

15th and 16th. The patient passed over these days without any increase of symptoms, the size of the abdomen being undiminished.

17th. The patient was annoyed a good deal by what she termed after-pains, which did not appear to me to arise from the womb. There was also some distress in breathing apparent, and the bulk of the abdomen was slightly increased; the bowels had been freely relieved.

At two o'clock in the morning of the 18th I was sent for to the patient, her breathing having become more oppressed, and the pain at the lower part of the bowels, called by her after-pains, being now severe. She was also very sick; pulse small and quick; skin hot. I took away sixteen ounces of blood from the arm, and ordered two grains of ext. opii to be introduced as a suppository. At 10 a. m. I

again saw her, and found she had had four hours' quiet sleep, but awoke agitated, and getting her breath with considerable difficulty. The pain had also returned with much violence, and was, at the period I was with her, extremely severe. The blood drawn in the night was buffed and cupped; and although from her greatly reduced state I would willingly have spared her an additional loss of blood, the extreme difficulty of breathing, together with the severity of the pain, obliged me to have recourse to a further abstraction of sixteen ounces, from which she obtained some relief. The circumference of the abdomen was now thirty-eight inches.

19th. The poor suffering patient had passed a miserable night, notwithstanding the use of the suppository; her breathing being hurried, the sickness constant, and the pain in the pelvic region very severe. The abdomen now measured forty-one inches; and I determined, more with a view to present relief than with any hope of permanent advantage, to draw off the fluid from the abdomen, by the operation of tapping, which I did in the afternoon of this day, and removed, by measure, five pints and a half of serum. The trocar was introduced at the usual place, but rather nearer to the umbilicus than pubis, some care being necessary to avoid the uterus, which at this period, (seventh day after delivery,) was still large, and its fundus to be plainly felt. From this operation she obtained very much relief; the abdomen diminished five inches. The mechanical pressure

on the stomach and diaphragm being in a great degree removed, the breathing was much more free, and the sickness less troublesome. She obtained also some hours' refreshing sleep. The improvement, however, as was anticipated, was but temporary; for on the 20th the vomiting returned, and was incessant, the stomach rejecting every thing that was put into it. The sickness was but slightly controlled by the hydrocyanic acid, of which she took three minims every four hours. On the 21st there was a slight amendment in appearance, although none in reality, the sickness being, from the patient's statement, lessened by the Prussic acid.

22d. The patient, as yesterday, in every respect more comfortable. Stomach quiet, retaining some arrow-root; pain much less, though occasionally very severe; the size of the abdomen now increased to forty-three inches; and although the freedom from constant pain and the cessation of vomiting contributed to render the patient's condition more comfortable, it was yet quite apparent that the system, notwithstanding this trifling amendment, was rapidly yielding its little remaining strength to the resistless assaults of disease.

She died at half past seven on the morning of the 23d, having been insensible the preceding twelve hours.

The body was examined seven hours after death,

before decomposition could have effected any change in the appearance of diseased parts. The upper part of the body was much emaciated. The lower extremities œdematous. On turning back the abdominal parietes, a large solid diseased mass, having a *fungoid appearance*, and lying on the left side, presented itself. On tracing this, it was found to be the left ovary, lying in the left iliac-fossa and ascending to the diaphragm, having that form of disease termed by Dr. Seymour "malignant tumour of rapid growth". On the right side, and lying in the pelvis, was the other ovary affected with the same disease, and forming the tumour which was felt before, and so much obstructed, the birth of the child; it entirely filled the hollow, and was very firmly attached to the bones of the pelvis. To the front, and resting on the tumour, was the uterus, being free from disease; behind which, and between the ovaries, was a portion of intestine very dark in appearance, being, as it were, strangulated by the pressure of the morbid growth. The intestines, in the neighbourhood of the tumour, bore marks of inflammation, in some parts severe. The pyloric end of the stomach was thickened, and in a state of scirrhus; the pancreatic glands much enlarged and indurated; the liver healthy in appearance; the gall-bladder distended, and having in it a single calculus; the kidneys very much enlarged, the substance of each containing ill formed pus of a strumous character. The ureters enormously dilated, each admitting, with facility, the tip of the little finger; this appear-

ance being readily accounted for by the pressure of the tumours, and consequent detention of the urine in its passage to the bladder; the bladder healthy, and containing about two ounces of urine. There were about two pints of serum inthe cavity of the abdomen; the left side of the chest contained about four ounces of serum; the heart, large vessels, and lungs being healthy. The head was not examined.

It is an interesting and important fact, in relation to the growth of the tumours, that I had attended this lady in two previous confinements, the last of which took place just eighteen months previous to the present one, and that on neither occasion was there any symptom to warrant the supposition that the ovaries were diseased, her "getting up" from each being uninterruptedly good. Her health also, during the first seven months of her recent pregnancy, was unusually good; although, from watching at the sick bed of her mother, and other circumstances, she had had much to try it. It was observed, however, by her friends and herself, that she was larger for the period than she had ever been before.

The weight of the preparation was estimated at about seventeen or eighteen pounds.

Harrow, January 16, 1832.

AN ACCOUNT

OF

SOME CASES

OF

CHRONIC ABSCESS OF THE TIBIA.

BY B. C. BRODIE, F.R.S.,

AND SURGEON TO ST. GEORGE'S HOSPITAL.

READ MARCH 27TH, 1832.

I AM not aware that any cases exactly similar to those which I am about to relate have been recorded by authors: and as they appear to me to throw some light on the history and treatment of a rare but very serious disease, I am led to believe that they are not unworthy of being communicated to the Medical and Chirurgical Society.

CASE I.

Mr. P., about twenty-four years of age, consulted me in October, 1824, under the following circumstances.

There was a considerable enlargement of the lower extremity of the right tibia, extending to the distance of two or three inches from the ankle-joint. The integuments at this part were tense, and they adhered closely to the surface of the bone.

The patient complained of a constant pain referred to the enlarged bone, and neighbouring parts. The pain was always sufficiently distressing; but he was also liable to more severe paroxysms in which his sufferings were described as most excruciating. These paroxysms recurred at irregular intervals, confining him to his room for many successive days, and being attended with a considerable degree of constitutional disturbance. Mr. P. described the disease as having existed more than twelve years, and as having rendered his life miserable during the whole of that period.

In the course of this time he had been under the care of various surgeons, and various modes of treatment had been resorted to without any permanent advantage. The remedies which I prescribed for him were equally inefficacious. Finding himself without any prospect of being relieved by other means, he made up his mind to lose the limb by amputation; and Mr. Travers having seen him with me in consultation, and having concurred in the opinion, that this was the best course which could be pursued, the operation was performed accordingly *.

* It is right that I should state briefly the termination of the case; especially as the circumstances attending it were probably connected with a peculiar condition of the nervous system occasioned by the long continuance of the local disease. Unfortunately I preserved no notes of this part of the case at the time, but I have no doubt that my recollection is accurate as to the

On examining the amputated limb, it was found that a quantity of new bone had been deposited on the surface of the lower extremity of the tibia. This deposition of new bone was manifestly the result of inflammation of the periosteum at some former period. It was not less than one-third of an inch in thickness, and when the tibia was divided longitudinally with a saw, the line at which the new and old bone were united with each other, was distinctly to be seen.

The whole of the lower extremity of the tibia was harder and more compact than under ordinary circumstances, in consequence, as it appeared, of some deposit of bone in the cancellous structure, and in its centre, about one-third of an inch above the ankle,

following particulars. The patient bore the operation with the utmost fortitude, but immediately afterwards he was observed to become exceedingly irritable, restless, and too much disposed to talk. Unfortunately in the evening there was hæmorrhage from the stump, which ceased, however, on the removal of the dressings and coagulum. During the night he had no sleep; and on the following day he was restless, and incessantly talking, with a rapid pulse. These symptoms became aggravated. There was no disposition to sleep, and the pulse became so rapid that it could be scarcely reckoned. Until the third or fourth day the tongue remained clean and moist. After this period it became dry, and somewhat brown, and there was constant delirium. The pupils were widely dilated, and the sensibility of the retina was totally destroyed, the glare of a candle not being perceptible even when held close to the eye. Death took place on the fifth day after the operation. No morbid appearances were observed in the *post-mortem* examination.

there was a cavity of the size of an ordinary walnut, filled with a dark-coloured pus. The bone immediately surrounding this cavity, was distinguished from that in the neighbourhood by its being of a whiter colour, and of a still harder texture, and the inner surface of the cavity presented an appearance of high vascularity. The ankle-joint was free from disease.

It is evident that if the exact nature of the disease had been understood, and the bone had been perforated with a trephine, so as to allow the pus collected in its interior to escape, a cure would probably have been effected, without the loss of the limb, and with little or no danger to the patient's life. Such, at least, was the opinion which the circumstances of the case led me to form at the time; and I bore them in my mind, in the expectation that at some future period I might have the opportunity of acting on the knowledge which they afforded me for the benefit of another patient.

CASE II.

Mr. B., at that time twenty-three years of age, consulted me in the beginning of February, 1826.

There was a considerable enlargement of the right tibia, beginning immediately below the knee, and extending downwards so as to occupy about one-third of the length of the bone.

Mr. B. complained of excessive pain, which disturbed his rest at night, and some parts of the swelling were tender to the touch. The knee itself was not swollen, and its motions were perfect.

He said that the disease had begun more than ten years ago, with a slight enlargement and pain in the upper extremity of the tibia; and that these symptoms had gradually increased up to the time of my being consulted. Various remedies had been employed, from which, however, he had derived little or no advantage.

Having inquired into the circumstances of the case, I was led to regard it as one of chronic periostitis; and I adopted the following method of treatment. An incision was made longitudinally on the anterior and inner part of the tibia, extending from the knee four inches downwards, and penetrating through the periosteum into the substance of the bone. The periosteum was found considerably thickened, and the new bone, which had been deposited beneath, was soft and vascular. The immediate effect of the operation was to relieve the pain which the patient suffered, so that he slept well on the next and every succeeding night. After this I prescribed for him a strong decoction of sarsaparilla. The wound gradually healed, and it was for some time supposed that a perfect cure had been accomplished.

The enlargement of the upper extremity of the tibia, however, never entirely subsided; and in August 1827 pain was again experienced in it. At first the pain was trifling, but it gradually increased, and when I was again consulted, in January 1828, Mr. B. was unable to walk about, and quite unfit for his usual occupations. At this period the pain was constant, but more severe at one time than at another, often preventing sleep during several successive nights. The enlargement of the tibia was as great as when I was first consulted; and the skin covering it was tense and adhering more closely than is natural to the surface of the bone.

Some remedies which I prescribed were productive of no benefit. The patient's sufferings were excruciating, and it was necessary that he should, if possible, obtain immediate relief. The resemblance between the symptoms of this case and those of the case already described, were too obvious to be overlooked. It appeared highly probable that they depended on the same cause; and I therefore proposed that the bone should be perforated with a trephine, in the expectation that an abscess would be discovered in its interior. To this the patient readily assented, and accordingly the operation was performed in the beginning of March 1828.

My attention was directed to a spot about two inches below the knee, to which the pain was particularly referred. This part of the tibia was ex-

posed by a crucial incision of the integuments. The periosteum now was not in the same state as at the time of the former operation. It was scarcely thicker than natural, and the bone beneath was hard and compact. A trephine of a middle size was applied, and a circle of bone was removed extending into the cancellous structure, but no abscess was discovered. I then, by means of a chisel, removed several other small portions of bone at the bottom of the cavity made by the trephine. As I was proceeding in this part of the operation the patient suddenly experienced a sensation, which he afterwards described as being similar to that which is produced by touching the cavity of a carious tooth, but much more severe, and immediately some dark coloured pus was seen to issue slowly from the part to which the chisel had been last applied. This was absorbed by a sponge, so that the quantity of pus which escaped was not accurately measured, but it appeared to amount in all to about two drams. From this instant the peculiar pain belonging to the disease entirely ceased, and it has never returned. The patient experienced a good deal of pain, the consequence of the operation, for the first twenty-four hours, after which there was little or no suffering. The wound was dressed lightly to the bottom with lint. Nearly six months elapsed before it was completely cicatrized: but in about three months from the day of the operation, Mr. B. was enabled to walk about and attend to his usual occupations. He has continued well to the present time (January 7, 1832); and the tibia is now reduced in

size so as to be scarcely larger than that of the other leg. No exfoliation of bone has ever taken place.

CASE III.

In the beginning of January 1830, Mr. S., thirty-four years of age, consulted me on account of the following symptoms.

The lower extremity of the left tibia was considerably enlarged; the skin covering it was tense, and adhered closely to the parts below. The patient complained of a constant aching pain, which he referred to the enlarged bone. Once in two or three weeks there was an attack of pain more severe than usual, during which his sufferings were excruciating, lasting several hours, and sometimes one or two days, and rendering him altogether incapable of following his usual occupations. The pain was described as shooting and throbbing, worse during the night, and attended with such exquisite tenderness of the parts in the neighbourhood of the ankle that the slightest touch was intolerable.

Mr. S. said, that to the best of his recollection, the disease had begun eighteen years ago, in the following manner. On going to bed one evening he suddenly experienced a most acute pain in the inner ankle. On the following morning he was unable to put his foot to the ground, on account of the agony which every attempt to do so occasioned. Leeches

were applied several times, and afterwards blisters, but the pain increased notwithstanding. After some weeks an abscess presented itself and broke. This was followed by some mitigation of the symptoms. Soon afterwards another abscess formed and broke in the neighbourhood of the first. The two abscesses remained open for a considerable time, and then healed rapidly. Mr. S. now began to regain the use of the limb, and by degrees was able to walk as usual.

During the following summer he had a recurrence of pain in the inner ankle, without any further formation of abscess. For eight or ten years afterwards there were occasional attacks of pain, lasting one or two days at a time; the intervals between them being of various duration, and in one instance, not less than nine months. After this the attacks recurred more frequently, and during the whole of the last two years the symptoms were nearly as severe as at the time of my being consulted.

On examining the limb I was struck with the resemblance which it bore to that of the limb in each of the two preceding cases. There was also a remarkable resemblance in the symptoms as described by the patient, and I could not but suspect that they depended on a similar cause. I requested that Mr. Travers, who had attended one of the former cases with me, should be consulted: and he agreed with me in the opinion that probably an abscess existed in

the centre of the tibia, and that it would be advisable to perforate the bone with a trephine, with the view of enabling the contents of the abscess to escape.

Accordingly I performed the operation, with the assistance of Mr. Travers, on the 31st of January. A crucial incision was made through the skin, the angles of which were raised so as to expose a part of the bone above the inner ankle, to which the pain was especially referred. A small trephine was then applied, and a circular portion of bone was removed extending into the cancellous structure. Other portions of bone were removed with a narrow chisel. At last about a dram of pus suddenly escaped and rose into the opening made by the trephine and chisel. On further examination a cavity was discovered from which the pus had flowed, capable of admitting the extremity of the finger. The inner surface of this cavity was exquisitely tender; the patient experiencing the most excruciating pain on the gentlest introduction of the probe into it.

He passed a tolerable night, and suffered but little on the following day. He continued to go on favourably until the 5th of February, when a violent inflammation attacked the limb immediately above the inner ankle. In spite of the application of leeches, an abscess formed, which in the course of six or seven days, presented itself immediately below the part at which the trephine had been applied. An opening was made with a lancet, and a considerable quantity

of pus escaped, which had apparently formed between the periosteum and bone, the latter being felt exposed at the bottom of the abscess. During the following month the inflammation excited by the operation continued, and several abscesses presented themselves in the neighbourhood of the first. These however all healed favourably without any exfoliation of bone taking place. The cavity made by the trephine became filled up by granulation, and the wound gradually cicatrized. From the time of the operation, the peculiar pain from which the patient had previously suffered, was entirely relieved: and it was not long before he was quite restored to health, and able to walk and pursue his occupations without interruption. I have seen him lately, nearly two years from the time of the operation having been performed, and he continues perfectly well.

AN EXPERIMENTAL INVESTIGATION

OF

THE EFFECTS

OF

LOSS OF BLOOD;

BY MARSHALL HALL, M.D. F.R.S. L. AND E.
ETC. ETC.

PRESENTED BY THE PRESIDENT.

READ APRIL 10TH, 1832.

After paying considerable attention to the effects of loss of blood as manifested by the human subject under the influence of blood-letting or hemorrhagy, I still felt that there were so many questions left in obscurity, that the investigation of them, in the way of experiment, was one, the object of which was at once legitimate and most important.

1. It was highly important to ascertain the effects of loss of blood, in circumstances entirely free from the complication of disease or other unusual condition of the system.

2. It was highly important to estimate the difference in the effects of loss of blood in the different ages.

3. It was also highly important to fill up a blank left in my former investigations by ascertaining more accurately and distinctly than before, the various organic changes induced by loss of blood.

4. And as blood-letting constitutes the most powerful of our remedies, and hemorrhagy one of the most formidable of diseases, it became of the utmost moment to fix the rules and limits of the employment of the former, and to ascertain the most efficacious mode of restoration in the latter.

The present paper is devoted to the inquiry into the effects of loss of blood in animals of adult age. They may be divided into: I. Syncope; II. Excessive reaction; III. Gradual sinking; IV. Immediate dissolution; and V. The organic changes.

The other parts of this inquiry, and especially that which relates to the effects of loss of blood in the young animal, are necessarily postponed to a future opportunity.

In all the experiments I had the advantage of the co-operation of Dr. Hope and of Mr. Field, so that their accuracy cannot be called into question. Indeed

the results were observed too frequently, and noted at the moment with too great care, to admit of error.

I shall first state the general deductions and principles which have flowed from the experiments, and then detail the experiments themselves. The experiments will be arranged in the order in which they appear best to illustrate the subject; but they will be dated in that in which they were actually performed. In this manner the facts detailed, even in the experiments themselves, will be given in the order of the phenomena; whilst some apparent discrepancies in regard to the periods at which they were observed, will be explained.

I. OF SYNCOPE.

Syncope may be considered as the first of the decided effects of loss of blood. In order to induce this condition several precautions are necessary. First, there must be a certain degree of strength in the animal; secondly, the blood must be drawn with a due degree of promptitude; and thirdly, the position must be more or less raised. If one or more of these circumstances be wanting, we shall, instead of syncope, induce a state bordering on dissolution, and very different from syncope.

In syncope, the whole of the phenomena appear to be dependent on the sudden abstraction of blood

from the *brain*. The languor of the eye and of the expression; the panting, or sighing, observed in the breathing; the cessation or extreme diminution of the frequency and force of the action of the heart and of the arteries; the loss of appetite; the nausea and vomiting; the debility of the voluntary muscles and the relaxation of the sphincters of the bladder and rectum, all appear to have this origin.

The truth of this remark, in regard to some of these phenomena, is obvious from the influence and effects of posture. The most remarkable of the phenomena of syncope may be renewed, after they have disappeared, by placing the animal in such a posture that the head shall be as much elevated, and the other parts of the body as much depressed, as possible: the countenance and the eye languish, and the head droops; the mouth then opens and the respiration becomes panting; if at this moment the ear be applied over the region of the heart, its action, distinctly perceived before, is found to be either suspended or so feeble as scarcely to be heard. On reversing the position, the animal is immediately relieved, it raises its head and looks about, the respiration, although impeded by so constrained a position, is greatly restored, and the beat of the heart becomes instantly perceptible, and in a short time loud and strong.

The influence of position upon the action of the heart, in cases of syncope, is one of the most interesting facts, ascertained, and repeatedly verified,

in the course of the subsequent experiments. It was at once marked and decided. The erect position subdued the action of the heart; the inverted position restored it, even still more promptly. Commensurable and coincident with the subdued action were the falling of the lip and panting; so that he who saw the animal knew distinctly what the other heard, who applied his ear to listen to the beat of the heart. If there were no pantings, the action of the heart continued; as the mouth opened and the animal panted, the pulsation of the heart ceased to be heard or felt.

From these facts it seems to be manifest that syncope depends chiefly upon the condition of the brain, and only in a secondary manner upon that of the heart itself.

It is further observable that in syncope all the functions are affected: the respiration and the power of the voluntary muscles first; then the action of the heart; then that of the stomach; then that of the bowels; and then that of the sphincters.

The degree in which these functions are affected varies. The drooping state of the head and eye-lid; the staggering walk; the panting and sighing; the feeble beat of the heart and pulse; the repugnance to food, are observed in the milder forms of syncope. In the severer, the breathing is laboured and performed principally by the diaphragm; there are nausea and vomiting; and the bowels are not only

moved, but the sphincter relaxed. Such a state of syncope is not without danger to life.

In the chain of phenomena in syncope a sigh constitutes the first link, and actual vomiting and relaxation of the sphincter the last. If there be more serious affection still there is the danger of dissolution. Vomiting itself only occurs in the most decided syncope; but there is repugnance to food in syncope in its slightest form.

If the appetite do not speedily return, if the respiration continue deep, or laborious, there is a danger of dissolution, although the beat of the heart and of the pulse appears somewhat restored. The condition of the *appetite* and of the *respiration* may be taken as the principal index of safety or of danger.

It is important to observe that syncope from a second blood-letting, and especially a third, in the same animal, is far less distinct than that from the first. The animal is more subdued; but the symptoms of syncope are less marked.

II. OF EXCESSIVE REACTION.

From the milder forms of syncope induced by the abstraction of blood, the animal soon recovers, the heart and arteries regaining and not surpassing their usual beat. The principle on which this recovery takes place may be denominated reaction. It appears

to be inherent in the animal constitution and not to admit of being referred to any more simple law of vitality.

From a first syncope, and even from a second if not too severe, the animal recovers to a condition not to be distinguished from that of health. But if the detraction of blood be repeated at such intervals and in such quantities as not to endanger life, the reaction passes beyond the limit of healthy action, and becomes excessive, presenting a peculiar and highly interesting series of phenomena.

As syncope appears to consist primarily, in a peculiar condition of the brain, so excessive reaction is as obviously an affection of the *heart*.

There is also this further distinction. The affection of the brain in syncope is immediately followed by an impaired condition of the respiration, of the circulation, and of the functions of the stomach and bowels, &c. In excessive reaction the function of the heart and arteries alone is affected. The respiration may be accelerated, but the eye is bright, the countenance and the manner lively, the appetite good.

That excessive reaction is independent of the brain, and dependent on the heart itself alone, seems to be proved by the total absence of any effect from change of position. When there is any tendency to syncope, the reaction of the heart is, as has been already

stated, subdued by the upright and restored by the inverted position. When there is full reaction, on the contrary, no such changes are observed; though the animal be long suspended in the erect position, there is neither panting nor cessation of the action of the heart or of the arteries.

I believe it may be stated that in all the effects of loss of blood, except syncope, the frequency of the beat of the heart is augmented. In syncope alone it is diminished.

The action of the heart and of the arteries in excessive reaction is characterized by a peculiar throb; that of the heart is accompanied by a peculiar noise resembling that of the saw or of the file, termed by the French 'bruissement,' and very discernible on applying the ear to the chest. The pulsation of the minuter branches of the arterial system, not to be felt in health, becomes quite perceptible.

In extreme cases not only the heart and the carotid and femoral arteries are observed to beat forcibly, but even the head is seen and felt to throb. Otherwise the brain does not appear to be at all affected.

It has been stated already that, during excessive reaction, the appetite and the other functions of the stomach and of the bowels remained unimpaired.

Even the process of assimilation goes on uninterruptedly within certain limits. One of the dogs subjected to the loss of blood gained half a pound in weight, instead of losing, although he had been bled seven times, and lost 35 ounces of blood, in the space of seven days.

The immediate effect of syncope is to lower the temperature; that of a first reaction to raise it. In the former condition the temperature sometimes fell below 96° Fahr.; in the latter it frequently rose to 101°, the natural temperature being 99°. The thermometer was placed far back between the teeth and cheek.

During the state of excessive reaction a little further detraction of blood affects the respiration, inducing panting, but it is better borne, within certain limits, than would have been expected. The animal soon recovers from its drooping state and does not lose its appetite for food.

Unless syncope be induced, the beat of the heart becomes more frequent; the peculiar sawing sound ceases for a very short time, but quickly returns, and the other sounds are very distinct.

In excessive reaction, not only the augmented impulse, but the 'bruissement' observed in the action of the heart, might lead to the erroneous conclusion that there was disease in this organ and its valves.

III. OF SINKING.

It is easy to induce the state of syncope. We have only, in a first blood-letting, whilst the animal's powers are undiminished, to take blood enough. The experiment is attended with no danger. Reaction follows, and does not generally pass the limit of health.

It is not more difficult to induce the fullest reaction. A moderate quantity of blood, taken each second day, will, if the animal be strong, soon issue in the singular series of phenomena which constitute this condition of the system. But I have found it extremely difficult to induce the state of sinking. If but moderate quantities of blood be taken, the animal soon rallies; if a larger quantity, dissolution and not gradual sinking follows; the animal dies during the night.

The phenomena manifested in experiments II. and IV., were the nearest to those of the sinking state; yet they consisted rather in an impaired and failing condition of the functions of the respiration, than of those of the *nervous system*, as observed in the pure and gradual sinking, which I have repeatedly had occasion to watch in the human subject. Still, these phenomena are of a most interesting character, and, even as they occurred in those experiments, border on those of sinking. Not the least so was the state of the cornea in several of the experiments.

With the peculiar full, deep, sighing respiration, the heart lost its diffused and throbbing beat, and the pulse its size and power; and the stomach was so affected as to lead to total loss of appetite, a symptom, which, if continued, I always found to be fatal.

The state of the respiration and of the appetite afforded the clearest indications of approaching dissolution. Whenever the animal continued to refuse food for several hours, it invariably died. The slight spasmodic twitchings observed in the ears and in one of the legs in Experiment VI., was also obviously of fatal omen. The louder state of the breathing during life, and the effusion into the bronchia, and the slight degree of œdema of the cellular membrane of the lungs after death, clearly denote the continuance, for a short period at least, of the true sinking state or failing nervous energy.

IV. OF DISSOLUTION.

Dissolution is probably, like syncope, principally an affection of the *brain*. In one animal, when the experiment of the erect and inverted positions was tried, a convulsive movement of the eyes was observed, and symptoms of dissolution, instead of mere syncope, were induced in the first of these postures, and there was no restoration of the action of the heart in the second, although no previous symptoms had occurred to indicate such immediate danger.

Approaching dissolution, yet not immediate dissolution, is denoted by a deep thoracic respiration, loud to the ear applied to the chest. Dissolution is more imminent when the respiration is laborious, performed principally by the diaphragm and abdominal muscles, and sighing and irregular. It is more imminent still when there is moaning; this usually leads to a peculiar whine, and perhaps to barking. Lastly, there is, in the act of dying, gasping, the gasps being repeated at longer or shorter intervals.

The condition of the respiration is thus, as we have already stated, an index of approaching or impending dissolution. The beat of the heart and of the pulse is sometimes performed with strength and regularity in the midst of a state of dissolution. As death approaches there are restlessness and various convulsive affections; the eye, the angles of the mouth, the head, and the fore legs are drawn spasmodically, and convulsed, and the limbs become stiff.

In the midst of this scene the sphincter ani is frequently relaxed, and the contents of the bowels discharged. After the last gasp, after the last convulsive movement, the heart can be seen, felt, and heard beating with force, and the pulse of the femoral artery is quite distinct. We observed this in several instances, and in one for many minutes.

This series of phenomena plainly shew that the functions of the brain are first impaired in the act of

dissolution, as in the state of syncope. When the brain has ceased its influence, the breathing is suspended, the action of the heart and arteries still continuing. Their functions cease in their turn, and with them doubtless those of the capillaries; in syncope, but especially in the act of dissolution, the ears, lips, and feet lose their temperature.

In cases in which the animal would doubtless recover if left in the horizontal posture, the vertical position may issue in immediate dissolution. This position, which leads to syncope in one instance, may induce convulsions and death in another. This fact was exemplified in Experiment III. How much practical information is involved in it! It is well known that a similar sudden dissolution has been the unexpected result of effort or of the upright posture, in the human subject reduced by hæmorrhagy or other loss of blood.

V. OF THE ORGANIC CHANGES.

The Brain.—If an animal die from the effects of one, two, or three abstractions of blood, the brain and the other viscera do not appear to be remarkably blanched. In the dogs which were the subjects of Experiments I. and III., in which thirty-two ounces and eighteen ounces of blood were lost respectively, the brain, lungs, and abdominal viscera appeared to contain pretty nearly their wonted quantity of blood. The appearance of the brain was perfectly natural;

its membranes and substance had their natural degree of injection; and the ventricles were free from effusion. Nor were the lungs or the stomach and bowels remarkably pale. In Experiment IV., in which twenty-eight ounces and a half of blood were abstracted, the brain was slightly paler than natural.

But if, on the contrary, the animal has survived a longer time under the influence of loss of blood, the brain, the lungs, and the stomach and bowels, are alike found blanched and drained of their blood. This was remarkable in the subject of Experiment V.: the brain was as pale as any other organ, and that without any effusion into the ventricles or about its surfaces. The conjecture of Dr. Kellie *, that there would, in such a case, be an effusion of a considerable quantity of serum, does not, therefore, appear to be well founded. Twenty-nine ounces of blood had been taken within four days; the dog was a young slim spaniel.

In Experiment II., fifty-six ounces of blood were taken in the course of seventeen days. For many days there were the most marked symptoms of reaction. The animal died immediately on being bled the last time, so that there was at no period the true sinking state. The brain was found less blanched than in Experiment V., but there was considerable effusion between the dura mater and pia mater, and

* Ed. Med. Chir. Trans., Vol. I. p. 116.

into the ventricles. The effusion was apparently connected with the long continued state of *reaction.*

In Experiments VI. and VII., in which sixty-seven and forty-eight ounces were taken respectively, there was less of the state of reaction, my object being continually to subdue such a state into that of sinking. There was accordingly no effusion; but the brain was blanched.

The Lungs.—The lungs were found natural in the subject of Experiment IV.; in that of Experiments II. and VI. a little frothy serum issued from the divided bronchia. It was only in Experiments VI. and VII. that any marked disorganization was observed: in these there were traces of emphysema and spots of congestion, or hepatization; and the bronchia and air cells both exuded fluid on being divided with the scalpel. These were distinctly the effects of the *sinking state,* though this was not long continued.

The Heart.—The right side of the heart generally contained blood. In Experiments II. and III., in which the examination was made immediately after death, the left ventricle was found perfectly empty. In Experiment IV., however, although the examination was also made immediately, the left ventricle contained abundance of blood.

The spleen in general appeared small.

The *other viscera*, except the liver, were blanched whenever large quantities of blood had been taken.

VI. OF THE CIRCULATION.

1. *Of the Blood.*—The blood having separated into serum and crassamentum, the proportion of the latter at first exceeded that of the former; but this proportion was gradually inverted, the quantity of serum augmenting, whilst that of the crassamentum diminished.

In several cases, but by no means in all, a creamy substance floated upon the serum. A specimen of this kind of blood was sent to Dr. Prout for examination. The cream-like substance was found to consist of oily matter, soluble in æther. It was readily taken up by silver paper, leaving a permanent oily transparency when the paper was dry. I think this appearance is to be associated with emaciation, and probably depends upon fat absorbed and carried into the circulation. In one instance only was there an appearance of buff. This was observed in Experiment VII., and it is remarkable that in this very case the crassamentum bore the greatest proportion to the serum throughout, whilst it was least firm under pressure.

2. *Of the Pulse.*—The pulse was sometimes made slower, sometimes more frequent, by the loss of blood. The former event was observed whenever, the pulse being but of moderate frequency previously, the effect was syncope; and whenever the pulse was of ex-

treme frequency previously to the blood letting. The latter was observed in all other cases.

3. *Of the Capillary Circulation.*—The effect of syncope is very obvious in the capillary circulation. The conjunctiva is blanched, and the ears and feet become cold. The thermometer was usually applied in these experiments far back between the cheek and gums. In this situation it was generally found to have fallen under the influence of syncope. It is probable that this would not have been equally observed in the axilla.

The condition of the capillary circulation observed in the web of the frog which has lost blood, is very peculiar. Instead of red vessels, transparent lines are seen pursuing the usual course of these vessels, and an occasional globule is observed running along them.

VII. PRACTICAL APPLICATIONS.

We may deduce from the foregoing experiments the extreme difficulty of ascertaining the state of immediate danger arising from loss of blood, whilst the animal retains the horizontal position. There is no phenomenon which clearly indicates such danger.

In the prosecution of these experiments I had continually to regret the want of a criterion for the extent to which I might allow the blood to flow,—a criterion which is afforded to the veterinarian by the position of the horse, and of which the physician may avail himself by directing his patient to be placed

upright. The dog is apt to pass from the sitting to the prone position, and then more blood may be withdrawn than he can bear to loose, before any distinct criterion of the sufficient quantity was apparent.

This difficulty was particularly felt when we attempted to induce the slowly sinking state. If we took too little blood, the animal rallied perhaps completely; if too much, it sank immediately. In another position the signs of an incipient syncope would have afforded us the guide and the warning which were wanted.

From observations made on the human subject, and in the course of these experiments, I am alike persuaded that blood-letting ought never to be employed in the horizontal position. The quantity of blood taken, although apparently moderate, may be beyond the powers of the system to bear. But if the erect position be adopted, the occurrence of syncope limits the flow of blood, and the change to the horizontal position affords a prompt refuge from danger.

We learn from these experiments that during the state of excessive reaction there is danger of effusion into the brain. That state must therefore be watched with peculiar anxiety in the cases of our patients.

We learn also that there is great danger of mistaking the state of excessive reaction for diseases of the heart and its valves. A correct diagnosis is, of course, of the utmost moment.

EXPERIMENT I.

Nov. 2d, 1830. The first experiment was performed on a terrier dog, aged 18 months, weighing 17 pounds, lively and muscular. It was bled to syncope; nearly 16 ounces of blood were taken.

As the blood flowed the eye became languid, the eye-lids partially closed, the head drooped, and the dog sank down upon its chest; it drew a deep sigh, the respiration was accelerated, and it drew a deeper sigh. Being placed on the floor it staggered, became sick and vomited, and evacuated the rectum.

Being now held up by the fore leg, the respiration became loud and hurried, the eyes closed, the head drooped, and there was a more complete state of syncope than before. Being then suspended by the hinder legs, the syncope was immediately relieved, and it looked about in a lively manner.

In subsequent experiments it was found that the beat of the heart ceased to be perceptible to the ears applied to the chest, during the state of syncope induced by suspending the animal by the fore legs, but that it was immediately audible on inverting this position. The effect of change of posture was repeated with a similar but far less marked result.

About a quarter of an hour after the blood-letting the action of the heart was barely audible, beating

80 times in a minute. It refused milk. At eleven o'clock, p. m., four hours after the blood-letting, it still refused milk.

At nine o'clock on the following morning it took a little milk, and then a little bread, and again a little milk; but it lay still and spiritless. At noon it took a little bread and drank milk more readily. At five o'clock, p. m., it was lively and leaped on seeing the milk and bread, which it took with avidity, and afterwards gnawed a bone.

At seven o'clock, p. m., the pulse being 140, the sounds of the heart loud and clear, the temperature between the lips and teeth and under the tongue, 98° Fahr., the ears warm, and the tongue rather furred and white, this dog was again bled to incipient syncope. Eight ounces of blood were drawn.

The animal soon opened its mouth, panted and sighed; the eye became dull and the eye-lids drooped. The respiration then became noisy in the nostrils, irregular, laboured, and performed principally by the diaphragm. The beat of the heart was imperceptible to the ear applied to the chest; that of the femoral artery 98. The fæces were discharged. The pupils were dilated and incontractile, the walk feeble and staggering.

There was less appearance of fainting, but more of

debility than the day before; the ears became slowly cool; the tunica conjunctiva was blanched; milk was refused.

At half past eight o'clock, one hour and a half after the detraction of blood, the dog still refused milk, and seemed feeble and spiritless. Its ears were cool. In three hours more the same observations were made; it breathed twenty-two times in a minute, and the pulse was 132.

On the succeeding morning, Nov. 4th, at nine o'clock, this dog still refused milk, which he lapped once only; there was a little moaning. The pulse was 144; the respiration 24; the temperature far back between the cheek and gums, 100° Fahr.; the tongue was whitish and furred. At five o'clock it lapped milk and took a little bread; the pulse was 132.

At seven o'clock, p. m., the pulse was 130, the respiration 24, the temperature 99° Fahr., the ears cool. The external jugular was again opened; eight ounces of blood flowed, which was thin; it separated afterwards into equal parts of serum and crassamentum.

During the flow of the blood the respiration became sighing and panting, the head drooping, the mouth open, the eye-lids partially closed; the animal then lay down, resting its head on the table, and assuming the posture on the side. Soon after the abstraction of

blood it evacuated the fæces, and in ten minutes more, the urine. The pupils were dilated; the pulse sank to 93, the temperature to 94° Fahr.; the respiration was first quick for three times and then followed by a full inspiration, and this by a full expiration; completed by a strong action of the abdominal muscles. The heart before the blood-letting beat loudly and clearly,—afterwards feebly; in half an hour, again loudly.

At one o'clock, a. m., the dog refused milk, and bread thickly buttered, and appeared dull. The temperature was 85° Fahr., the pulse 120, the respiration 24, and slightly snoring. The ears were cool; the bowels very relaxed.

At nine o'clock, a. m., of Nov. 5th, this dog was found dead, the limbs having been obviously drawn by convulsive action.

The cavities and viscera were examined at eight o'clock, p. m. The brain was absolutely blanched, the longitudinal sinus empty, the ventricles free from effusion. The lungs were blanched and free from œdema; a little mucus was observed in the bronchia.

The right side of the heart, the large veins, and the vena portæ were all distended with dark-coloured blood; the left side of the heart contained a little florid blood. The stomach and intestines were blanched.

This dog lost 32 ounces of blood; viz. 16, 8, and 8 ounces on successive days.

Even after the last blood-letting there were no phenomena to lead to the idea that the animal would not recover. We were therefore forcibly struck with the difficulty of judging of the degree of danger in cases of loss of blood.

EXPERIMENT II.

Nov. 6th, 1830. The subject of this experiment was a terrier, two years old, 16 pounds in weight, thin and lively, its pulse 120, respiration 30, and temperature 99° Fahr.

Eleven ounces of blood were drawn from the external jugular vein. During its flow the eyes became dull and partially closed; the dog slowly sank upon its chest and looked sluggish and drowsy; it staggered on attempting to walk and stood wide; it refused milk. There was no further approximation to syncope. These symptoms were mild and supervened tardily. We bled it cautiously, having lost the former dog somewhat unexpectedly.

On the following morning this dog remained dull. We did not, therefore, venture to bleed it.

On the succeeding morning (Nov. the 8th) it became lively, and in the evening presented the following phe-

nomena: the pulse was 160, the respiration 30, the temperature 101° Fahr.: the beat of the heart was attended with a whizzing noise.

The external jugular vein was now opened, and five ounces and a half of blood were withdrawn. This afterwards separated into three ounces of serum, and two ounces and a half of crassamentum. It gushed out at first. In half a minute the dog drooped, closed the eye-lids, hung down the head, sank upon his chest, and lay passive, and sighed. There was no sickness. The pulse fell to 108, the respiration to 20, the temperature to 98½° Fahr.: the beat of the heart could not be felt. In two minutes the pulse rose to 116, the respiration to 22. The impression made by the abstraction of blood on this day, was much greater than on the day before, though the quantity taken was but one half.

At half past eleven, p. m., the respiration was 22, the pulse 128, the temperature 98° Fahr. The heart and arteries had a throbbing beat. The dog would scarcely lap milk, and it refused bread.

At ten o'clock, a. m., Nov. 9th, the temperature was still 98° Fahr. the respiration 22, and the pulse 140.

At seven o'clock, p. m., the pulse had risen to 160, it indeed varied from 160 to 180; it was accelerated by the slightest excitement. The beat of the heart

was a throb, accompanied by a whizzing sound. The arteries partook of the same throbbing character; the pulse was felt in many branches, as the maxillary and labial, in which it cannot be perceived under ordinary circumstances; the carotid and femoral arteries throbbed exceedingly; and if the head were held between the two hands a general beat and throb were communicated to them.

The effect of a varied position in suspending or renewing the beat of the heart in a state approaching to syncope having been ascertained in intermediate experiments, the dog was now suspended by the fore feet, the head being kept upright; the beat of the heart continued, however, as before: it was then suspended by the hinder feet, the head hanging down; but no difference in the action of the heart was discernible. The beat of the heart in the case of reaction appears, therefore, to be uninfluenced by position.

On the succeeding day, Nov. 10th, at eight o'clock, p. m., the phenomena were the same. The temperature was 101° Fahr. We still postponed, until another day, the abstraction of blood.

On Nov. 11th, at seven, p. m., the pulse and the beat of the heart were nearly the same as the two days before. The heart beat 144 times in a minute, with throbbing, and the same "bruit de lime." The temperature was 100½° Fahr. The sound of the heart was examined in the upright and reversed, per-

pendicular, positions; and little difference was observed.

The external jugular was now opened; the blood flowed well in a small stream; it was allowed to flow until the dog drew a sigh; the vein was then immediately closed. The quantity was found to be nearly three ounces and a quarter, of which one ounce and three-quarters, after twenty-four hours, were serum, and one ounce and three-eighths crassamentum.

After the blood-letting the pulse varied from 96 to 108; the temperature became 99° Fahr.; the respiration about 28, but various; the whizzing sound of the heart was lost. In twenty minutes the pulse rose to 160 and the whizzing sound of the heart became as loud as ever.

At this moment the influence of the upright and inverted positions, was again tried; in the former, the sound of the heart became very feeble, with other symptoms of syncope; in the latter, it was immediately restored, but it shortly afterwards again became feeble, apparently from fatigue, or the impeded state of respiration. These phenomena were by no means so marked as in other experiments, in which a state of more perfect syncope was induced. It was, however, perfectly obvious.

The animal being laid on the table, its eyes were ob-

served to be bright, the pupils contractile. The animal appeared subdued, and the head drooped. The ears were cold. The temperature 98° Fahr. The respiration occasionally sighing. Relaxation of the sphincter ani, with escape of flatus.

By this detraction of blood the previous reaction was merely subdued, without any appearance of syncope, except when the animal was suspended by the fore feet. The reaction speedily returned, and the throb in the heart and arteries became very remarkable.

Nov. 12th. The dog has been very lively and does not appear in the least indisposed. The pulse is from 150 to 160; the temperature 99° Fahr. The action of the arteries is even still more throbbing, and the whizzing noise in that of the heart, if possible, more marked. The ears and feet are cool. The appetite good. Indeed there is no morbid phenomenon except the throb of the heart and arteries.

Nov. 13th. The pulse is 132, the respiration 32, the temperature 100° Fahr.; the tips of the ears rather cool. The pulse has rather less throb; the whizzing sound of the heart is as distinct as ever, but the impulse less.

Four ounces and three-quarters of blood were drawn from the external jugular vein, which again separated, in 24 hours, into three ounces and a

quarter of serum, and one ounce and a half of crassamentum. The dog sank down. The heart lost its whizzing sound; and the first and second sounds became distinct. The pulse fell to 108; the respiration was 24, the temperature 99½° Fahr. He was languid and subdued, and refused meat.

At eleven o'clock, p. m., he was again quite lively; he took meat and milk, and did not refuse bread soaked in milk. The respiration was 28, the pulse 150, the temperature 96° Fahr.

On Nov. 14th, at seven o'clock, p. m., the pulse was 152, the respiration 30, the temperature 100° Fahr.; he was quite lively and had taken food eagerly. He was therefore again bled to four ounces, which separated into two ounces and three-quarters of serum, and one ounce and a quarter of crassamentum. He panted, sighed, sank down, and lay listless with the eyes half closed. The respiration was 26, the pulse 108, the sounds of the heart very feeble.—In five minutes he rallied and took meat with avidity.

On Nov. 15th, at seven o'clock, p. m., the pulse was 160 and thrilling, the sawing sound of the heart unabated, the respiration 24, the temperature 99° Fahr. Four ounces and a quarter of blood were drawn; it separated into three ounces of serum, and one ounce and a quarter of crassamentum.

The respiration became 28, the pulse was slow but grew gradually quicker, and the sawing sound of the heart, which had disappeared, gradually returned. It took meat.

In this experiment the dog sighed and sank promptly, but the other signs of syncope were less marked even than in the former blood-lettings.

On Nov. 16th, at seven, p. m., the pulse varied from 152 to 160 and 168; the respiration from 24 to 28; the temperature was 99° Fahr.; the tips of the ears were cool, the beat of the heart had the "bruit de scie," and that of the artery its thrill. Two ounces and three-quarters of blood were taken away which separated into two ounces and three-quarters of serum, and one ounce of crassamentum.

In five minutes the animal was lively and took meat eagerly. The pulse was 156, the respiration 30, and the temperature 99° Fahr. On weighing him, he had actually gained half a pound!

On Nov. 17th, at seven o'clock, p. m., the pulse was 158, the respiration 24, the temperature 99° Fahr.; the "bruit" of the heart was the same, the ears were cool. Blood was taken until he sighed thrice. It was found that three ounces and a quarter had flowed, and this separated into two ounces and a quarter of serum, and one ounce of crassamentum.

The pulse fell to 100, the respiration to 20, and the temperature to 96° Fahr.; the "bruit" continued. At ten o'clock, p. m., the pulse was extremely frequent, the animal more subdued than before; he took food, but less greedily than usual.

On Nov. 18th, at seven, p. m., the pulse was 160, and jerking, the respiration 24, the temperature 99° Fahr.; the sound of the heart as before, the dog more languid and dull. Two ounces and a half of blood were taken; it separated into one ounce and three-quarters of serum, and three-quarters of an ounce of crassamentum.

The dog drooped, and sank down without sighing. It remained still and prone for some time. The pulse was 132; the sound of the heart was weaker.

On the 19th it appeared more subdued than usual; the pulse was 168, the sound of the heart continued, the respiration was 24, the temperature 99° Fahr. It lost two ounces one dram and a half of blood, which separated into one ounce five drams and a half of serum, and half a dram of crassamentum.

It sighed and the respiration became slightly laborious, the pulse 132 and feeble, the temperature 98° Fahr., the respiration 20 and deeper, the "bruit" continued.

On weighing the dog to-day, it was found to

have lost, since the 16th, two pounds. The signs of reaction were less marked, and there was a state more bordering on sinking.

On Nov. 20th, the pulse was nearly 180, and thrilling; the sound of the heart still more remarkable than before; the respiration twenty-two, the temperature 99½° Fahr.; the carotids were felt to beat. The head drooped; there was an unwillingness to sit up or move. The tunicæ conjunctivæ were observed to be a little inflamed. The appetite good.

The animal was now bled to six ounces and three-quarters, of which four ounces and five drams were serum, and two ounces and one dram were firm crassamentum without buff.

The pulse became fuller during the flow of the blood, and the animal sighed. Shortly afterwards the pulse was counted and found to be 120 in a minute; the respiration was 22, deep and diaphragmatic, the temperature 96°. The palpebræ were partially closed, the pupils unusually contracted.

At midnight, five hours after the blood-letting, the pulse had risen in number, and varied between the rates of 160 and 216 in different twelfth parts of a minute; the respiration was 22, deep and regular; the temperature 96° Fahr. The eyes were plainly intolerant of light, the pupils much contracted; a

film of mucus was spread over the corneæ, especially the right one, which was a little cloudy. The pulse had still a remarkable thrill or throb; the heart its 'bruissement'; the head itself seemed moved by the pulsation. A little nice meat was taken; but what had been taken eagerly enough before was now refused. There was a little tottering in walking. The hair had started and appeared shaggy and rough, especially on the forehead.

In the morning of the 21st, this dog remained dull and in his corner. The eyes were generally closed; when opened the cornea was observed to be slightly opake, and covered with mucus, especially that of the right eye; the pupils were contracted, and the eyes turned from the light.

The pulse was 180, the respiration 24, the temperature 98°; the end of the nose warm and dry. The animal was feeble and emaciated; he took nice mutton, but reluctantly. In the evening he was weighed and found to have lost ten ounces. We did not venture to take blood. It appeared plain that symptoms of sinking, the state we wished now to watch, were coming on.

On Nov. 22nd, at seven o'clock, p. m., the pulse was 190, the respiration 24, the temperature 99°; the right cornea was still more cloudy.

The animal was bled to six ounces five drams,

of which four ounces and a half were serum, and two ounces and one dram crassamentum, firm but free from buff. During the flow of the blood the symptoms were but the same as on the previous occasions of blood-letting. The pulse sank to 128; the respiration became deep and sighing, and remained at 24; the temperature sank to 96° Fahr.

The animal now lay subdued and prostrate. The beat of the heart was visible. There was no relaxation of the bowels nor sickness. Shortly, however, the bowels were evacuated and the respiration became laboured, and it was doubtful whether he would recover.

From this time he sank,—with the following phenomena in the order in which they are detailed. The under lip fell; there was a peculiar moan; the angle of the mouth was convulsed; one leg was convulsively drawn; it was difficult to separate the teeth; and there was stiffness of the limbs. The respiration became deeper and more laborious, inspiration being performed by a strong contraction of the diaphragm and expiration by that of the abdominal muscles; the respiration then became gasping, and the gasps occurred at longer and longer intervals. There was once a loud whine. At another time the dog lay still and as if dozing. The expired air was cold. There was no sickness. The rectum was evacuated.

At length, after a few more gasps at distant in-

tervals, the respiration ceased. Still the heart could be heard beating with varying frequency for many minutes, so that all the three gentlemen present were severally satisfied on this point more than once.

We immediately proceeded to the examination. The brain was, in its external appearance, blanched, but not so much so as in the subject of Experiment the VIth. Fluid was found effused rather abundantly between the dura and pia mater and into the ventricles. The longitudinal sinus contained a little blood, and the choroid plexus and other vessels displayed a degree of colour from florid blood. The substance of the brain was pale and entirely free from red points in the parts divided by the scalpel.

The right ventricle of the heart was full of venous-coloured blood; the left ventricle was perfectly empty. The aorta contained plenty of blood. The lungs were extremely pale. A little fluid exuded apparently from the air passages, on making incisions through their substance. The stomach and intestines were pale; the mesentery was crossed by vessels of a florid colour. The spleen was small, compact, and paler than natural. The cornea of the right eye rather opaque; the conjunctiva entire.

This little dog lost in all $56\frac{3}{4}$ oz. of blood: on Nov. the 6th, 11 oz.; 8th, $5\frac{1}{2}$ oz.; 11th, $3\frac{1}{4}$ oz.; 13th, $4\frac{3}{4}$ oz.; 14th, 4 oz.; 15th, $4\frac{1}{4}$ oz.; 16th, $2\frac{3}{4}$ oz.; 17th, $3\frac{1}{4}$ oz.; 18th, $2\frac{1}{2}$ oz.; 19th, $2\frac{1}{4}$ oz.; 20th, $6\frac{3}{4}$ oz.; and the 22nd, $6\frac{1}{2}$ oz.

We were all again impressed by this experiment, with the extreme difficulty of judging with accuracy of the quantity of blood which we may safely withdraw, unless we have some criterion which we did not possess in this instance. Such a criterion is afforded us in the human subject and even in the horse, by the influence of posture in denoting the effects of loss of blood. Dogs always sink down, and their position, therefore, becomes nearly horizontal; otherwise earlier syncope would have warned us to take less blood. The horse, on the contrary, retains his posture, with his head raised, and that of the human subject may be controlled, so that we have a guide in such cases which we had not in this.

As in the first experiment we had the marked symptoms of syncope, so in this we had those of reaction and of the act of dying. It still remained for us to watch the symptoms of the slow failure of the powers of life. It will be seen that we again and again failed in our object of inducing this condition. But the experiments afford additional confirmation of some of the phenomena we had witnessed before, and some additional observations.

EXPERIMENT III.

Nov. 9th, 1830. A mongrel dog, weighing seventeen pounds, aged two years, fat and of a dull and heavy disposition, was bled from the external jugular vein. Eight ounces of blood flowed, and he began to sigh; he looked subdued, the eyes were half-closed,

he sank upon his chest, and the respiration became accelerated and laboured.

At this moment he was suspended by the fore legs, the head being raised. He began to pant in two minutes, opening the mouth and half-closing the eyes; the pupils dilated, and the head fell. The ear was then applied over the heart, the beat of which could not be perceived. The position was then reversed, and he was suspended by the hinder legs. The beat of the heart became instantly distinct, and the signs of syncope disappeared.

This change of position was repeated twice, with the same results, but in a less and less marked form. During the second and third accessions of syncope, the beat of the heart could still be perceived; but the change, on reversing the position, was still very marked.

After the experiment, this dog remained dull and languid, and could scarcely be coaxed to take bread soaked in milk.

On the succeeding day this dog was again bled to incipient syncope. Ten ounces of blood were drawn. He sighed as the blood flowed, drooped his head, and sank on the chest, and the respiration became laborious.

On being held erect, suspended by the fore legs,

he panted and laboured in breathing, the eyes were moved convulsively, the mouth opened, and the lips fell; the beat of the heart was perceptible. On being suspended by the hinder legs, he scarcely revived, but the beats of the heart became distinct; they, however, remained feeble, unequal, and intermittent. It became plain that it would not recover.

Being laid on the table, the limbs and trunk were convulsed; the respiration became gasping; the beat of the heart continued quite perceptible to the ear for several minutes after the last act of respiration.

On inspection the brain was found perfectly natural, neither blanched nor suffused; the ventricles free from effusion. The right side of the heart contained abundance of dark-coloured blood; the left side was perfectly empty, not containing even a drop. The lungs, and the stomach and intestines, were by no means remarkably blanched. The examination was made immediately after death.

This dog lost eighteen ounces of blood, eight on the 9th, and ten on the 10th day of November. It presented the important phenomenon of dissolution, induced by mere position!

EXPERIMENT IV.

Nov. 13th, 1830. A mongrel dog, aged one year

and a half, well fed, strong and lively, weighing twenty pounds, was bled until he began to sigh. Ten ounces and a half of blood were drawn, which separated, in twenty-four hours, into four ounces of serum, and six ounces and a half of crassamentum.

Before the blood-letting, the respiration was 23, the pulse from 116 to 120, the temperature 100.

During the flow of the blood, he first sighed, and then turned restless. The respiration then became quicker, with a little noise in the nostrils, and there were increased restlessness, struggles, a little whining, and a relaxed state of the sphincter ani, and discharge of flatus and fæces. The pulse was 120, the breathing 46, and the temperature 94° Fahr., and he refused meat.

At eleven o'clock, p. m., four hours after the abstraction of blood, this dog appeared quite well.

On the succeeding day, Nov. 14th, at seven o'clock, p. m., he was again bled to nine ounces, of which, after twenty hours, four were serum, and five crassamentum.

During the flow of the blood, he sighed and struggled, as on the day before. Afterwards he drooped, sank down, panted, and refused meat. At night he appeared quite recovered.

Nov. 15th, seven o'clock, p. m., this dog has been lively, and eager for food all the day. The pulse is now 156, the temperature 98° Fahr.

He was bled again to nine ounces, which separated into five ounces of milky serum, and four of crassamentum.

During the flow of blood he began to whine and struggle, sank, sighed, and panted. Afterwards, he lay prostrate, evacuated the rectum, refused meat; the heart beat with the "sawing" sound. In ten minutes more he appeared to have sunk rather than to have rallied; he suddenly became affected with opisthotonic spasm of the neck, and spasm of the fore legs, and appeared dying. A little alcohol and water was given. Shortly afterwards, he began to moan, then to whine, and then to bark, and then he became sick, vomited, and seemed relieved. This was repeated in half an hour, and he again appeared easier, having vomited some portions of bone.

From this time he was obviously sinking. At length the respiration ceased; but the pulsation of the heart was seen between the ribs, and felt and heard on applying the ear, and the pulse was perceptible in the femoral artery for several minutes.

The viscera were immediately examined. The brain was a little paler than natural. Many blood-vessels

were seen containing a florid blood. The longitudinal sinus was nearly empty, the plexus choroides a little faded, the ventricles without effusion.

The right side of the heart contained a little blood; the left, abundance. The lungs were perfectly natural. The stomach and bowels rather pale, much filled with food. There was a good deal of fat.

This dog lost twenty-eight ounces and a half of blood; ten ounces and a half on the first day, nine on the second, and nine on the third. The proportions of serum and crassamentum were 4 : 6 $\frac{1}{2}$; 4 : 5; and 5 : 4, respectively.

EXPERIMENT V. Nov. 24th, 1830.

DATE.	OUNCES.	SERUM.	CRASSAMENTUM.
Nov. 24	$12\frac{1}{2}$	$4\frac{1}{2}$	8
26	$7\frac{1}{4}$	$3\frac{3}{4}$	$3\frac{1}{2}$
27	$9\frac{1}{2}$	$5\frac{1}{4}$	$4\frac{1}{4}$
	$29\frac{1}{4}$		

This experiment was performed on a slim spaniel, about fifteen months old, nineteen pounds in weight; the temperature $99\frac{1}{2}°$ Fahr. Twelve ounces and a half of blood were taken slowly, and separated in twenty-four hours into four ounces and a half of serum, and eight ounces of crassamentum. The dog sank down and panted.

Being suspended by the fore legs, with the head

erect, the beat of the heart became inaudible, with panting; on inverting his position, the sounds of the heart became accurately distinct, and the panting ceased.

On Nov. the 26th, the pulse was 120, the temperature 99° Fahr. Seven ounces and a quarter of blood were taken, which separated into three ounces and three quarters of serum, and three ounces and a half of crassamentum. The respiration became accelerated and sighing, and performed chiefly by the diaphragm. The animal was restless. The pulse sank to 96 and then rose to 88. The blood flowing freely, the symptoms of syncope were more manifest than on the 24th.

On the next day, Nov. 27th, the pulse was 150 and a little throbbing; the impulse of the heart considerable and the sound loud; the temperature $99\frac{1}{2}°$.

Nine ounces and a half of blood were taken, which separated into five ounces and a quarter of serum, and four ounces and a quarter of crassamentum.

The animal first sank; then the respiration was observed to be accelerated, but it was not audible in the nostrils. The pulse fell to 88, and shortly afterwards to 72. There was then a degree of sighing but no deep sigh.

The pulse in a little time rose to 80 and had a slightly throbbing beat. The action of the heart was loud and with a considerable impulse. The respiration remained sighing or deep. The animal lay subdued, voided the bladder but not the rectum, and refused nice meat.

After this the limbs became cold. A cup of hot milk was poured down the throat and retained on the stomach. The extremities and the body were rubbed.

At eleven o'clock, p. m., three hours after the blood-letting, this dog remained in a state of extreme languor, and the ears and feet were very cold. The pulse was 144, and as well as the beat of the heart, slightly throbbing. The respirations were from 12 to 14, and deep, and loud to the ear applied to the chest. The temperature far back between the lips and gums was 87°, and in the axilla 89°. He staggered excessively and could scarcely guide or sustain himself when made to walk.

Two tea-cupsful of hot broth were given and retained; he was rubbed well for an hour, until the ears and feet were quite warm; he was then laid before a moderately warm fire upon a warm rug.

When left at one o'clock, a. m., the pulse was rather less frequent; its beat and that of the heart, not without strength; the respiration was deep,

thoracic, regular, and without much labour, and loud to the ear applied to the thorax,—very different from that of syncope mild or severe. The eye was bright. He once or twice raised his head. In the morning this dog was found dead.

Examination.—The brain was perfectly blanched. Not a vestige of fluid was found either between the membranes or in the ventricles. A very few large vessels were seen containing blood. The plexus choroides was pale. The tuber annulare alone manifested a few red dots on being divided.

The left side of the heart contained much blood; the right, a little. On cutting and pressing the lungs, a little frothy mucus exuded from the divided bronchia in several parts. The stomach and bowels were blanched. The spleen was small and dense.

EXPERIMENT VI.

The subject of this experiment was a black terrier, aged about 18 months; two and a half pounds in weight; the temperature between the gums and back teeth 99½° Fahr. The quantities of blood taken, and of the serum and crassamentum into which it afterwards separated, are shewn in the following table:

DATE.	BLOOD. OZ.	DR.	SERUM. OZ.	DR.	CRASSAMENTUM. OZ.	DR.
Nov. 23	11	0	4	4	6	4
24	3	6	2	0	1	6
29	8	3	4	5	3	6
Dec. 2	5	2	3	0	2	2
4	4	3	2	4	1	7
6	5	1	3	2	1	7
8	4	2	2	4	1	6
9	5	5	3	3	2	2
11	6	1	4	0	2	1
15	6	2	4	1	2	1
18	9	5	7	0	2	5
Days 26	69	6				

The effects of the various blood-lettings were so similar to those observed in the experiments already detailed that I purposely avoid making any distinct report of them until Dec. the 4th. On this day it was reported, before the blood-letting, that the cornea of the left eye was opake and the conjunctiva vascular, with an increased secretion of mucus; the pulse was 132, and throbbing, the heart throbbing with considerable 'bruissement' on applying the ear: immediately after the blood-letting the pulse rose to 180, and from throbbing became small; the beat of the heart lost its throb and its 'bruissement' whilst its two sounds were heard *distinctly;* the respirations were sixteen in a minute, and deep, but without labour, and there were one or two sighs; the animal walked pretty well, then lay down and refused meat; in a very short time he raised his head and took food, and the heart was found to have regained its 'bruit.'

It was thought proper to keep the animal, at this

moment, in the perfectly erect position: the beat of the heart became feeble, and still more frequent, and again lost its 'bruit'; but it remained distinct; there was no panting.

On Dec. the 12th, the pulse varied from 160 to 180; the respiration was deep and sighing; the temperature 96° Fahr.

On the morning of Dec. the 13th, the pulse was 132 and small; the respiration deep, sighing, and frequent, considering its character, that is varying from 20 to 24, and audible in the nostrils. At eight o'clock, p. m., the pulse was 160 and larger; the temperature 99° Fahr. At midnight, the pulse was 150 without throb; the respiration 18, very deep, loud to the ear applied to the chest, and in the nostrils during expiration; the beat of the heart was without 'bruit,' without throb, and heard only in the cardiac region, not diffusely over the chest as in circumstances of reaction; the end of the nose was dry and warm, the ears cool; yet the eye was bright, and the appetite good.

On the 15th, the pulse was 156 and had recovered its throb; the heart was heard extensively over the chest, with much 'bruit'; the carotid was *seen* beating in the neck, the respiration was 20 and had lost its deep and sighing character; the temperature was $98\frac{1}{2}$° Fahr. The animal was quite lively. The eye recovered.

After the blood-letting on the 15th, the pulse im-

mediately rose to 192; the flow of blood was immediately arrested on observing one sigh; the pulse and heart retained their throb; the appetite remained, and there was neither drooping nor lassitude.

On the 16th, the heart was heard to beat with 'bruit,' and extensively over the chest, the pulse was 132; the emaciation extreme, the weight eleven pounds and a half. After blood-letting to nine ounces and five drams on the 18th, the pulse was 168, and there was great prostration of the strength and of the appetite.

I watched the animal until one o'clock in the morning. It did not lie prostrate; but its breathing had the peculiar deep and sighing character observed on the 13th, being loud to the ear, and in the nostrils, with a very slight degree of moaning; the beat of the heart was 144 and without throb, and confined to its own region. The ears and mouth were cold; the nose dry; there was a spasmodic movement of the ears and of one leg. Nothing could induce the animal to take food; but a little water, and warm broth, were poured down the throat.

At this period I supported it in the erect position. Little change was observed. Its heart beat as before. In about ten minutes, however, it began to suffer from fatigue and I laid it down on soft hay. The pulse sank from 120 to 108, and it did not recover its former frequency or beat. Having covered it with

flannel, I left it for the night. In the morning it was found dead.

On examination, the brain was blanched, but there was no effusion, a few red points were seen on the divided surfaces. The tips of the lungs were slightly emphysematous, and in one place solid and apparently hepatized. Much fluid issued on making a few incisions; and the bronchia were found, on a careful examination, to contain much frothy fluid. The stomach and bowels were pale; not distended. The spleen was small.

EXPERIMENT VII.

This experiment was performed upon a white terrier, 15 months old, and ten pounds and a half in weight; its temperature was 99½° Fahr. The quantities of blood taken are given in the following table:

DATE.	BLOOD.		SERUM.		CRASSAMENTUM.	
	OZ.	DR.	OZ.	DR.	OZ.	DR.
Nov. 30	5	4	1	5	3	7
Dec. 1	7	2	2	2	5	0
3	3	3	2	1	1	2
4	2	4	1	6	0	6
6	3	2	1	6	1	4
8	3	0*				
9	4	4	2	4	2	0
11	3	4	2	0	1	4
15	5	4	3	0	2	4
16	5	0	3	4	1	4
18	4	6	2	1	2	5
Days 19	48	1				

* This blood was sent undisturbed to Dr. Prout for his examination. See p. 265.

Nothing remarkable was observed in this animal until Dec. 4th, when the symptoms of reaction were fully established: the pulse was 160 and throbbing; the heart beat with impulse and 'bruit' extensively over the chest; the eyes were bright: during the flow of the blood the respiration was first sighing and then diaphragmatic, and the heart lost its impulse, 'bruit', and diffused beat; the eyes became languid; he, however, took food.

On the 10th the pulse was 180, and the 'bruit' quite extraordinary: after the blood-letting the pulse was 144, and a little later 120, and there was sighing and panting.

On the 11th the pulse was again 180, the temperature 100° Fahr. and the 'bruit' as on the previous day. The coagulum was, for the first time in these experiments, observed to be covered with a thin layer of buff, which extended down its sides, so as to encircle it.

At midnight, on the 13th, the pulse was 150, with scarcely any throb in its beat; the respiration was 18, deep, sighing, loud to the ear, inaudible in the nostrils, and slightly moaning; the beat of the heart, from being diffused, became confined to the cardiac region, without throb, but with 'bruit'; the end of the nose was dry and warm, the ears slightly cool; the animal appeared dull and languid, and sought re-

pose, but its eye was bright, and its appetite for food remained.

On Dec. the 15th, the recovery was complete, the pulse was 160 and throbbing, the heart beat with much 'bruit' and impulse, extensively over the chest, the throb of the carotid was *visible* in the neck; the respiration was 24, expiration loud; the temperature 100° Fahr.; the dog was lively, the eye bright, the nose damp and cool, the appetite good; the ears were cool, the hair stood on end, and the emaciation was extreme. After the blood-letting, the pulse was only 144, there was slight sighing, but food was not refused.

On the 16th the pulse sank from the loss of blood, from 172 to 144, the respirations from 24 to 12, assuming the sighing character. The weight was nine pounds and a half.

On the 18th, the pulse before the blood-letting was 180, after it 128; the respiration sank from 18 to 12, and was full and slow.

At midnight the dog still refused food; the pulse was 144 and small; the beat of the heart neither throbbing nor diffused; the respiration was deep, loud to the ear, heard in the nostrils, and attended by slight moaning; the ears and internal mouth were cold; the animal supported itself in the position on the belly. In the morning it was found dead.

On examination the brain was found blanched, without red points, and without effusion. The lungs were slightly, yet distinctly, emphysematous, and on making free incisions, a little serum exuded; the tip of one lobe was hepatized; the bronchia contained much frothy mucus. The stomach and bowels were pale but not distended. The spleen small.

There still remains an important part of this inquiry. It is that of establishing a comparison between the effects of loss of blood in the adult and the young animal. I have already made several experiments, and hope, on some future day, to present the results to the Society. They will be of the utmost importance in guiding us in the use of blood-letting in infancy.

OBSERVATIONS

ON

THE LOCAL DISEASES

TERMED MALIGNANT.

BEING A SEQUEL TO THE PAPER PUBLISHED IN VOL. XV. OF THE SOCIETY'S TRANSACTIONS.

By BENJAMIN TRAVERS, Esq., F.R.S.,
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PART III.

READ APRIL 24TH, AND MAY 8TH, 1832.

The paper which I now present to the Society, is designed as a sequel to the communication on the subject of Malignant Diseases, published in the fifteenth volume of the Society's Transactions. In that paper, after some general preliminary remarks, I described the several forms of cancerous diseases affecting the head familiar to my observation. I now proceed to describe those of the trunk and extremities, and in the following order.

1stly. The external conglomerate glands, viz., the salivary and mammary.

2dly. The organs of generation and urine, male and female.

3dly. The viscera of the chest and abdomen.

4thly. The superficial regions of the body, trunk, and extremities.

THE SALIVARY GLANDS.

The salivary glands, except in the "cynanche parotidæa," are seldom attacked by acute inflammation, but are sometimes enlarged and hardened by chronic strumous inflammation, still retaining their figure. They are rarely the subjects of primary scirrhus. In the scirrhous tumours and cancerous ulcers of the mouth and tongue, they become indurated and diseased; but in all cases they are slow to suppurate, whether affected by common or specific inflammation; in this respect differing from the conglobate glands. The enlargement, also, is often not conspicuous, when the hardness of these glands is considerable; and I have repeatedly noticed that they are not in any way altered by the existence of disease in the vicinity, by which the absorbent glands are affected.

I have more than once known a lymphatic gland, overlaying and adherent to the parotid, removed by the knife, for what was considered to be a malignant enlargement. In some instances this has proved to be a scrofulous degeneration of the gland, socia parotidis, invested by so firm a cyst as to have led to doubts of its nature. Some years ago, a man from

the neighbourhood of Rochester came to my house much reduced and terrified by a very free hæmorrhage, following the extensive slough of an ulcerated tumour of the parotid, reputed to be a cancer, to which an itinerant empiric had applied an arsenical caustic. The wound, however, cleaned and cicatrized soundly, though with much puckering. I have very recently learned that this man retains his health, though a similar tumour occupies the place of the former, with which he wisely declines to interfere.

The sublingual and submaxillary glands may be the seat of scirrhous inflammation, when the tongue is sound. But I do not recollect a case in which the affection of these glands was not consecutive to that of the skin, or of some neighbouring part. A twelvemonth after the extirpation of a cancer of the lip, I have seen a large immoveable tumour, involving both these glands, and occupying the entire hollow of the lower jaw to the os hyoides. Its situation and connexions were such as to defy operation, and the man soon died (a cancerous fungus springing from a lancet-wound in front of the tumour) of hæmorrhage and suffocation. Upon the whole, scirrhous cancer is more common in the superjacent skin, and medullary cancer in the lymphatic glands, in the region in which the salival glands are situated, viz., at the angle and within the horse-shoe of the lower jaw.

The "thyroid gland," a term which, though familiarized by custom, is unauthorized by any thing we know of this structure, I have seen involved in a thoracic medullary tumour, but never the subject of scirrhous inflammation. Its diseases are, in my experience, remarkably simple, being confined to a parenchymatous enlargement, the solid and encysted forms of bronchocele. In Desault's works, a tumour of this part is described to have followed upon violent extension of the neck, and was by him extirpated.

THE MAMMARY GLAND.

No texture of the body is subject to a greater variety of morbid affections than this. The neuralgia of this organ, a well known complaint, exists in a complicated as well as in a simple form. In the generality of cases of irritable breast there is no perceptible change of structure, but it is sometimes superadded to the slight and partial thickening which results from a blow or a wound, and sometimes to a simple enlargement of one or more lobes of the gland, or a small tubercle or encysted tumour attached to it. The principal morbid affections of this organ, are,

1st. The phlegmonous abscess in the connecting cellular membrane of the gland protruding sometimes above and sometimes below, or to one side of the nipple, and which is perfectly dissimilar to abscess resulting from obstruction of the milk ducts. It occurs in young full-bosomed women, often acquires consi-

derable size, and greatly disfigures the outline of the breast. 2nd. The proper mammary or milk abscess. 3d. The firm, smooth, subcutaneous tubercle, round or oblong, of various size, and perfectly moveable. 4th. The soft uneven tumour resembling, as if an overgrowth, the glandular structure, and not detachable from the gland. 5th. An udder-like tumour, having a smooth white homogeneous section, resembling that substance. 6th. The varicous tumour of the lacteal ducts, being a portion of the gland, irregularly knotted, and hard to the touch, indistinctly bounded, and moveable only with the breast. 7th. The cellulous tumour, being an enormous pendulous elongation of cellular texture and skin, of an equable, doughy consistence, chiefly inconvenient from its volume and weight. 8th. The hydatid tumour, so called, i. e. a combination of cysts of various extent, containing a gelatinous fluid, and occupying the place of the gland. The above are all innocent, all recognized and distinguishable forms of disease, if not always readily from each other, at least from the malignant diseases of this organ.

The following are the original forms of cancer of the breast; scirrhous, and medullary. 1st. The scirrhous tubercle, of impenetrable hardness, irregular surface but distinct outline, at first moveable, but tending as it increases to become fixed, first to the skin indenting the surface, and then to the muscle beneath. 2d. The encysted tumour, containing a straw or coffee-coloured fluid, with a berry or fringe-

like growth, from one or more points of its internal surface; the cyst is generally subdivided into compartments, or there are several contiguous cysts. This I regard as the primitive form of medullary cancer when it appears in the region of the mamma.

There are equivocal or bastard forms of scirrhus, deviating in their commencement from the standard above described, as,

1st. The partial induration and enlargement of the lobules and ducts of the gland, most common in single or sterile women, which, when near or behind the nipple, produce more or less indentation of this part, and a bloody oozing from its orifice. This is after some time followed by an excoriation, or an indolent superficial ulcer having an even glossy and florid surface, and from its situation, and especially from the thickened condition of the parts beneath, indisposed to heal. The pain is transient and not acute, the subject delicate and frequently has traces of scrofula. This, though of strumous origin, is capable of assuming the action of cancer, and provided it be not removed, the chances are, that, 'to this condition it must come at last.' The diagnosis is always embarrassing; there may be enough to justify the surgeon in saying 'this is not cancerous,' but he cannot feel at liberty to add, 'nor will it ever become so.'

2ndly. An indolent or passive scirrhus;—a form which progresses so slowly, and is productive of so

little disturbance to the system, that but for the alarm of the patient's mind at the bare idea of cancer, the medical man would not be made acquainted with its existence. By an indolent scirrhus I mean an incompressible permanent tumour, possessing for many years no distinguishing character of that disease; but in a deranged state of health assuming its genuine character, and at a particular period of life breaking up into a cancer. I do not entertain a doubt that such a tumour may be and often is absorbed in its first stage, and need not therefore of necessity follow this course. I feel assured that most of the hard breast tumours of young and middle aged women admit of being reduced by the iodine or the mercurial ointment if early resorted to, and steadily persevered in, having often succeeded in procuring their absorption by such means, when, from the characters they presented, I should otherwise have felt compelled to urge their removal by operation. I have likewise known them gradually reduced, and at length absorbed by equal and persevering compression, as by strips of soap and adhesive plaster, or what is better, by an elastic roller passed many times round the chest with layers of the Amadou smoothly interposed between the turns of the roller. A certain degree of adhesion between the breast and pectoral fascia in these cases, rendering it partially fixed, yields, as the volume of the tumour diminishes. Nothing is more certain than the susceptibility of absorption in many such tumours at an early stage of their existence.

If a scirrhous or any other tumour is so large as to occupy a considerable portion of the gland, so much adhesive matter is thrown out around it, and into the interstices of the lobes, as to give great increase of weight, much irregularity, and impenetrable firmness to the swelling. Pressure in this case is not endurable. An habitual irritant acting upon the skin keeps the swelling in check and sometimes partially reduces it: e. g. muriate or acetate of ammonia, distilled vinegar, lotions of camphorated spirit, acetate of lead, and spirit. vini. rect., etc. The muriated tincture of iron, or the tincture of iodine, or a solution of lunar caustic sufficiently diluted to admit of their constant application, discolouring and causing the exfoliation of the cuticle, and if still persisted in, a free oozing from the cutis, I have also employed with similar effect. The solution of chloride of lime effected the absorption of a large tumour, regarded by competent authorities as scirrhus, in a lady, whose other breast had been extirpated for that disease. Many months elapsed before the swelling finally disappeared, and there remained deep folds of integument bound down to the chest, as if the extirpation had been freely practised. This lady not long afterwards died of asthma from diseased lungs; the scirrhous tubercle appearing not only in the chest, but in several of the abdominal viscera; and I have seen the same symptoms and appearances following the spurious cicatrization of the cancerous ulcer under the same application, and also after a spontaneous partial absorption of a scirrhous tumour leaving these

folds from adhesion to the muscle. The solution employed was half an ounce of the chloride in half a pint, and afterwards six ounces of distilled water. The effect of this application to cleanse and in a great degree to level the edges of cancerous ulcers, and induce a process of spurious skinning, has several times fallen within my knowledge.

Chronic tumours of a suspicious character, accompanied by superficial glossy ulceration, I have seen greatly diminished by various medicaments and vapour baths; but the tumour never quite removed nor the ulcer soundly healed.

It is remarkable that a granulated or spiculated tumour, that is, a congeries of rounded or angular prominences combined with hardness has been generally regarded as the definition of a true scirrhus; this I suspect has resulted from studying the disease where it most frequently exists, in the female breast. It is a character incidental to the structure of that organ rather than proper to the disease, being produced by slow adhesive inflammation of the lobes and tubes, in and among which the matter of scirrhus is deposited. The rounded or granulated tumour occupies the loose lobular texture, and is situated toward the base of the gland; the angular or spiculated tumour is situated more among the tubes and towards the nipple; in each instance the thickening of the glandular and tubular structure concurring

with the absorption of the interstitial membrane. Many tumours, not allied to scirrhus, have this character strongly impressed on them, belonging to the class No. 6, denominated above 'varicous tumours'*. Although the granular and spicular characters are therefore not proper to the disease, but to the organ, they serve respectively to mark two principal differences of form in these tumours, and determine their peculiarities of size, situation, and growth. The scirrhous granulated tumour, for example, occurs chiefly in large breasted women about or after the decline of the catamenia; it acquires great size, and becomes gradually but at length firmly adherent, of a stony hardness, and depressed in the centre. This depression at length turns convex, and the skin inflamed and ulcerating, discharges, and forms a sore

* I knew a poor woman who had a large breast removed for the varicous tumour under much alarm at the development of the same affection in the remaining breast, and hesitating whether to consent to the removal of it, to which she was strongly urged. She followed my advice in refusing the operation and continues, though several years have elapsed, in good health.

Such tumours are not generally painful, nor do they disturb the health otherwise than as they create anxiety. In young women, however, of the hysteric temperament, these, as well as all tumours, are subject to be the seats of pain. In a young lady in whom the varicous tumour was unusually developed, it was exceedingly painful, especially about the menstrual period. The pain was of an obtuse kind. I have now under my observation a similar case in which both mammæ of a young single lady are affected, and have been occasionally extremely painful. The pain is always exasperated by topical applications, which are likewise of little if any avail in diminishing such swellings.

which is never afterwards healed. Up to a late period the health remains good. The situation is mostly upon the axillary side of the mamma at the edge of the great pectoral muscle. There is seldom any affection of the axillary glands. The ulcer is of course unable to heal upon the centre of such a tumour, so indurated. Eventually after an uncertain interval it turns cancerous, and assumes the well known characters of that ulcer.

The spiculated tumour is smaller and more contiguous to the nipple. This is at first circumscribed and freely moveable, but soon becomes fixed, and the nipple drawn in; or if the nipple be flat, the skin covering the tumour is depressed: the absorbents are cord-like at the edge of the pectoral muscle, and the axillary and clavicular glands indurated. It is this tumour which sometimes projects in one or more firm nodular tubercles which assume a florid and polished surface long before ulceration commences.

Thus in scirrhous tumours of the female breast, the two principal distinctions are, 1st. A tumour massive and round like a cricket ball, and occupying a large proportion of the gland, as if embedded in its centre; in which case the breast is large, and the quantity of covering which it affords gives roundness and elasticity to the tumour, notwithstanding its hard nucleus. 2nd. A circumscribed and superficial tumour of an equal stony hardness throughout, small, knotted, and irregularly shaped, in which case the

breast is thin, or of small volume. These differences as before observed, depend, not on the size of the tumour, but of the breast, not on the texture but the position of the scirrhus, and materially influence the alteration in figure, the formation of adhesions and involvement of the nipple, and I think the rate of progress of the disease; the last described being considerably the most rapid *.

The principal varieties of scirrho-cancerous action in the breast are,

1st. The disposition mentioned in a former part of this paper to cutaneous erythema and tubercle, and herpetic instead of excavating ulceration. This I have seen equally in spare and corpulent patients. There is a cancerous tubercle of the skin which appears upon the breast as in other parts, connected with a remarkable change in the texture of the skin. The affection of the skin in the case I am describing is I believe primary. It consists of a brawny induration with extension of the areolæ, a coarseness such as this texture presents when viewed through a magnifier, and which gives it a resemblance to pig's skin. Isolated tubercles of various sizes appear at considerable distances apart; the texture of the subjacent cellular membrane is enormously thickened and has a cartilaginous hardness; and the breast,

* Allowance is of course to be made for the stage of the disease in all cases.

when the skin undergoes this change upon that organ, is early and immoveably fixed to the chest.

2ndly. A species of dry gangrene succeeding to the ulceration of the skin and parts beneath, having little if any appearance of living granulation in edge or surface, or any thing resembling purulent secretion. The edges are livid, tuberculous, retorted, but the bed of the wound is occupied by a dark tenacious crust or slough, which separates slowly in flocculent masses, still leaving a dead surface; or if a granulating spot, like an oasis, appears, it almost immediately fades and turns sloughy. The discharge is a watery ichor, fetid, often copious. This peculiarity I have observed in spare subjects where the cellular membrane has been very scanty, and entirely devoid of adeps. I believe the defect of cellular membrane, as in the return of the disease after operation, partly conduces to it; but it is also connected with extreme constitutional irritability and exhaustion.

I have witnessed several examples of the medullary tumour commencing in the immediate neighbourhood of the female breast. The two most remarkable were in plump but delicate women between 30 and 40 years of age, exhibiting the strumous temperament. The following case exemplifies the appearance of the disease when seated in the female breast; but this imparts to it no character differing from that which it assumes in other parts of which cellular texture enters into the composition.

Medullary tumour of the breast, thyroid gland, &c.

Anne Jenkins, æt. 42, unmarried, perceived a small tumour on the right mamma eight months since, the catamenia having ceased for two years. During the last two months its growth has been rapid, and it is now very large, adhering partially to the pectoral muscle; and the adhering integument is red approaching to livid. It gives an obscure sense of fluctuation in many parts, in others is hard; at one spot where is the cicatrix of a lancet-wound, made some time since by a surgeon who thought it contained a fluid, there is now a nipple-like projection yielding and elastic. The proper nipple retains its natural appearance, being unadherent to the tumour. She has had good general health till lately. Pulse now quick and feeble, occasional sharp pains at the epigastrium, and rest disturbed.

April 18th. The projection and discolouration are much increased and the surface begins to slough: from this time to the middle of August following the fungus went on increasing, until it attained an enormous size; large portions of it sloughed out occasionally and emitted a very fetid discharge, and about a month before her death, which happened on the 16th September, nearly the whole mass sloughed off, leaving a deep, extensive, and very foul ulcer in the right pectoral region.

Sectio Cadaveris. A collection of thick, dirty-

looking fetid pus lay between the sac and pectoral muscle. The sac was very dense. On slicing the small remains of the diseased structure, it exhibited an appearance resembling the medullary part of the brain, in some parts finely vascular, in others pale; the lowermost part of it was a firmer substance, white and homogeneous like udder. The thyroid gland was in four distinct lobes; two in front of the trachea of the natural size of the gland, each containing a dense cyst of a brown-yellow colour, with white transverse bands: the two lateral lobes running up the neck as far as the hyoides were like masses of indurated fat, of an equal and firm texture. The thoracic and abdominal viscera were sound; the right kidney had several cells containing masses of yellow transparent gelatine, and resembling the structure in the thyroides.

The tumour with which alone this is liable to be confounded is the hydatid breast, as it is called, and there is sufficient resemblance in the rounded outline, the elastic resistance, the absence of glandular affection, the distressing inconveniences of size, weight, and distension, the turgid veins and livid discolouration of the surface, to create some hesitation. But in the medullary disease it seldom happens that the health is not affected, whereas in the hydatid breast it is undisturbed; the figure of the medullary tumour is less uniform, being marked by dark tuberous elevations and immoveably fixed to the side by the prolongations of the diseased growth in one or more parts of its circumference; whereas the hydatid tumour, not-

withstanding its oftentimes enormous bulk, is globular, and remains perfectly detached and pendulous. The main distinction is, that the mammary gland is not, in my experience at least, the seat of the medullary or fungoid disease, as it is of the hydatid, but I shall speak to this point in a future part of this paper. The tendency of the hydatid tumour to reproduction after operation has led to an opinion that the disease is of a malignant character; this is however erroneous, and can only have arisen from the common circumstance of its reappearance owing to the difficulty of eradicating the extended nidus of the disease in the cellular texture; for where an inclosed and insulated body like the testis is the seat of it, I never knew an instance of its return after extirpation. The disease destroys by irritation where it returns for a second and a third time, as I have known it to do after removal. The cysts when it acquires great bulk inflame and suppurate, so that the discharge is its own glairy secretion mixed with pus. It should be removed before it acquires such magnitude by an incision far beyond the confine, if possible, of changed structure *.

In proportion as the malignant fungus is recent and of small dimension, is the difficulty of diagnosis from the hydatid cyst, for the fungus, as I have before said, ordinarily commences on the interior of a cyst containing a fluid, from the vascular lining of which it hangs like a

* If allowed to acquire a great magnitude, it is difficult by any precaution to prevent its recurrence.

fringe, and it is common to find more than one, often several contiguous cysts in the early stage of the disease. As the fungi grow, the cysts burst, and are blended in the same mass. From this account, it will appear, that there is sufficient analogy between the hydatid and fungoid disease in its incipient state, to require more aids to diagnosis than those derived from manual examination. We sometimes meet with puzzling analogies in these diseases, as in the following case.

A woman applied to me in July, 1816, with an enormous swelling of the breast, sixteen inches in circumference, from the centre of which sprung a cauliflower excrescence. A year previous to this, a cyst, occupying the position of this excrescence, had been tapped at Guy's Hospital, and three quarters of a pint of brown-coloured fluid drawn from it; the cyst continued oozing for some time, and then healed. Shortly afterwards, the cyst again burst, and discharged a quantity of fluid, and since this second opening, the fungous excrescence had been growing to its present bulk. The pain was smarting and aching, not lancinating, and the health was undisturbed. Large loaded veins ran over the swelling, the fungus was irritable, and bled on the lightest touch. On the 28th of July, the tumour was very freely removed, and the woman left the hospital well, on the 12th of the following month. On dissection, the breast was found to be an encysted tumour, subdivided into cells containing an unhealthy pus, and a fungus, bearing, it was thought, a strong resemblance

to the medullary carcinoma, and beside this, was a firm knob or tubercle, which had the gristly feel and section of scirrhus.

The history of this case furnishes an explanation of these appearances. The disease was an hydatid tumour, the principal cyst had been emptied—a fistulous ulcer established itself, whence a fungus arose, as is generally seen in large cysts when communicating by a small orifice with the surface,—the condensation of the intersecting walls of the cysts was produced by artificial pressure employed after the first opening, for the purpose of obliterating the cyst. The presence of puriform fluid shewed the existence of inflammation in other parts, in another stage. Similar appearances, I suspect, have given origin to a belief that the medullary and scirrhous cancer were coexistent in the same or contiguous textures. Closer examination will demonstrate that the resemblance is imaginary.

No description can comprehend all the varieties of tumour to which this organ is liable, nor does any share of experience enable the nicest observation to suggest an infallible clue to their nature. We have sometimes only manipulation to depend upon, which is an art imperfectly cultivated by scientific surgeons. Cases now and then arise about which the most accurate observers are liable to error. True it is, this does not frequently happen in the distinction between innocent and malignant growths. The several species

of innocent tumours already enumerated may all be distinguished from scirrhus with comparatively little difficulty; but if any doubt exists we must consider the age, habits, and circumstances of the patient. For example, we should ascertain if marks of scrofula are present, if the uterine functions are regular and healthy, if the tumour can be referred to violence in the commencement, which from the exposed situation of the organ is far from uncommon, if more than one lump exists in the same breast, if both breasts are affected; if painful, the character of the pain; if any absorbent glands are altered in the neighbourhood, and how. How many cases of breast-tumour are in the recollection of experienced surgeons which have been dispersed by some one or other of the remedies in ordinary use, local or constitutional; and how many that have resisted all and remained stationary for years, the patient's mind having been tranquillized by the assurance of their innocency. Doubtless on the other hand a fatal result has sometimes administered a silent but painfully intelligible reproof to the over confidence of the surgeon.

The cases in which the cancer mammæ is allowed to run its course unirritated by applications, where the easy circumstances and tranquil mind of the patient, joined to a phlegmatic physique, admit of plentiful nourishment and sufficient rest, and where the habits are conducive to strict cleanliness, often occupy a very considerable period of time, and really inflict very moderate suffering. I have known women

manage, with the assistance of their maids, horrible fetid ulcers for years together, looking stout and well, in the enjoyment of good spirits, rest, appetite, and seeming rather to be amused than annoyed by the superintendence of their own cases. They ring the changes upon the old woman's remedies of goose grass and prunes boiled in milk, &c., &c. After lingering long in the scirrhous stage, such cases are again retarded in that of superficial ulceration; then comes a more decided and extensive change in the complete giving way of the inflamed wall of the tumour, and the formation of large masses of slough in the hollows of the ulcer; this again goes on slowly though the pain is occasionally severe; the fetor nauseates, and the profuse ichorous discharge gradually wastes the strength. This slow rate of progress in cases left to themselves is so much in contrast with those which have been submitted to operation, as far as my opportunities have afforded me the means of comparison, that I always deprecate an operation, if the circumstances both of the part and constitution do not offer the fairest prospect of final success. But indeed an operation should never be resorted to in this case, as a *pis aller*, but as a measure resting upon its own merits, independent of the alternative.

The best application to cancerous ulcers for the purpose of preserving them clean, improving the discharge, and lessening the tendency to putrefaction, is Fincham's Solution of Chloride of Lime ℥ij. or ℥ss.

to 8 or 12 oz. of water. The hollow of the ulcer is to be lightly filled with finely drawn lint soddened in the solution, and covered with an ointment of the oxyd of zinc or bismuth spread on lint or cambric. When the sore is very painful, the watery solution of the extract of hemlock or opium may be occasionally substituted. An ointment consisting of powder of bark and a portion of opium well mixed with hogs' lard, is an excellent cleansing application, and so are the vegetable poultices.

The only case of malignant tumour in the male breast which I have had an opportunity of watching, and ultimately investigating, was briefly the following.

A waggoner, æt. 58, had perceived a lump of the size of a marble in his left breast three years before he became my patient in St. Thomas's Hospital. It was then the size of a pullet's egg, hard, irregular, not freely moveable, and very painful after handling. A cluster of enlarged and indurated glands were seen in the axilla and above the clavicle. He was wasted in flesh, and had a cadaverous complexion, a bad cough, with dyspnœa, and mucopurulent expectoration. Soon after his admission the tumour became adherent to the skin all round the nipple, and of a livid hue, with large varicous veins running over it. The pain was aching, not darting. The absorbents at the edge of the great pectoral muscle were so raised and corded as to confine the

arm to the side. A dark incrustation next appeared on the surface of the breast within an areola of livid spots. During this process the tumour dwindled in size, and at the same time small detached tubercles formed in the neighbourhood. The pulmonary symptoms and hectic increasing, he died about four months after his admission. The post mortem appearances were as follow.

An ulcer was formed in the larynx; the pleuræ were generally adherent; all the lobes of the lungs were studded thickly with hard tubercles of various sizes, from a garden pea to a horse-bean; upon section they presented a white medulla, with a dark deposit in the centre. The pericardium was coated on both sides with a thin pellicle of lymph. The ventricles of the heart were thickened, and the valves and membrane of the heart and aorta opake, presenting spots of earthy deposit. The enlarged glands were of a gristly texture, and had a lobulated appearance from the condensation of the connecting membrane. The other organs were free from morbid change.

The above, it will be observed, is not the scirrhous tubercle, such as we meet with in the female breast; nor can any analogy of structure be cited to explain the locality of the disease when it appears in the male breast, which is rare, and its situation probably altogether fortuitous. But the isolated medullary tubercle presenting a considerable degree of firmness, and upon section a black or grey deposit

intermixed with the white, is a form in which the characters of the scirrhous and the medullary cancer seem to blend; a connecting link, though strictly belonging to the latter species.

The structure of the female breast, it must be admitted, is strongly predisposed to the formation of the scirrhous tubercle. Occasionally, though not often, its origin is traceable to a blow.

I have seen the growth of a scirrhus suspended during gestation, and the tumour after the woman's delivery resume fresh activity, i. e. break into cancer during suckling; this I have twice seen in young women. One died, immediately after the amputation, of pleuritic inflammation, and the other by a slower process, without submitting to operation.

Certain anomalous morbid changes, as large fungous excrescences and deep cavernous fetid ulcers are now and then the sequelæ of tumours in the female breast, which are, in a loose and slovenly classification, termed cancerous. They are not so; but they are almost as incapable of being conducted to a curative termination as if they were; their progress can scarcely be said to affect the health, being remarkable for its slowness and freedom from pain.

Two remarkable instances have passed under my observation: the one, a single cylindrical tubercle rising perpendicular to the centre of the breast of an

elderly lady, six inches in circumference at the base, and four in height, and perfectly moveable. It presents a surface of healthy granulations, discharging good pus, and its texture is spongy and compressible to the fingers embracing it. The surrounding skin is a little thickened by slight œdema and discoloured. No glandular affection—no pain. The surface is disposed to bleed, and sometimes profusely, like a varicous tumour. This has been the slowly developed result of a reputed scirrhous tumour of many years' standing *.

The other is the case of a widow lady, also of advanced age. A hard livid-coloured tumour, of the size of a small orange, projects from the right breast above the nipple, and the entire left breast presents a dark coloured swelling of great hardness, but perfect mobility, of from six to seven years' growth; and for the last four years, the period since it broke, an extensive, deep, and sinuous ulcer, having everted edges at its mouth, and discharging freely of sanies and pus, which is rendered extremely fetid by the constant coming away of dense masses of slough. Here also there is no pain nor any sensible affection of the health; but a remarkable circumstance connected

* This lady died, since the above was written, of a complaint in the bowels. Before her death the tumour sloughed entirely off, and the sore which it left had nearly healed. I macerated the remnant of the tumour and examined it carefully through a magnifier. It was reticulated and most analogous to a section of dry sponge.

with the case and perhaps influencing it, is an almost habitual menorrhæa, which is sometimes very considerable *.

Another anomalous form is an excoriation of the integument around the nipple, gradually extending over the breast, accompanied by an ichorous exudation. It remains for many years in this state, and resists permanent healing: ultimately it throws up a broad toad-stool fungus, exquisitely irritable, and much disposed to bleed. Such a case was last summer under my observation. It neither affects the glands nor the health.

I cannot determine whether this is malignant or not, neither can I divest my mind of suspicion. In the case to which I have referred, the lady refused her consent to the removal of the breast, and I have received news of her death only a few days since.

2dly. The organs of generation and urine:—

THE TESTICLE.

The testis is subject to partial and general induration from inflammation, with or without increase of bulk. The most frequent cause of inflammation of the testis is the affection sympathetic with that of

* This lady, who resided near Maidenhead in Berkshire, is very recently deceased.

the urethra, absurdly denominated hernia humoralis. When with the reduction of its preternatural bulk the body of the testis recovers its natural consistency of texture, and long afterwards in many cases, the epididymis remains more or less enlarged and indurated, especially the extremity called globus major; very gradually its original state is restored. In the indurated enlargement which follows blows, pinches, &c. as sometimes in the first stage of acute hernia humoralis, the body and epididymis are so confounded as that the interstice betwixt them is not perceptible. In chronic enlargements, which are slow inflammations from injury, from cold after mercury, from long standing stricture, or irritation at the neck of the bladder, and as some suppose, from the absorption of a venereal poison, the shape of the testis is curiously altered; the most frequent change is an oviform elongation with flattened sides. The first and surest sign of absorption is the restoration of the natural cleft between the body and epididymis. When the cord participates in the enlargement and gets a whipcord hardness, the affection is more obstinate of removal. But in a considerable proportion of recent cases the cord is not sensibly affected, and the disease being attended to in time, never becomes so. I have heard it stated on respectable authority that the affection of the cord is present in all cases of inflammation following mechanical violence, by which this origin of the swelled testis is distinguished from the sympathetic swelling termed hernia humoralis. My own observation does not

enable me to confirm, but on the contrary prompts me to deny the general accuracy of this position. The pain of the chronically enlarged and indurated testis is obtuse, greatly depending upon the weight of the part, where it is allowed to be in any degree pendulous.

Sometimes the surface of the swelling is nodose and irregular, instead of being smooth and uniform, and the induration is absolutely stony, instead of being simply inelastic. This state has been called the scirrhus of the testis, being supposed from the combination of these characters to resemble the scirrhus of the mamma. But neither hardness nor nodosity are, as formerly shewn, faithful diagnostics of scirrhus, nor is the hypothesis borne out by the progress and sequel of these cases. The majority of such cases undergo a slow absorption when submitted to the influence of mercury, local and constitutional, and where they resist this, either soften slowly, being supported, and the skin kept perspirable by a plaster, or if not, become surrounded by a dropsical accumulation which seems to relieve the part slowly and thus to reduce its bulk. The ordinary mode of treating hydrocele, and obliterating the cavity of the tunica vaginalis, has the best effect upon these chronic enlargements, and may be practised with perfect safety.

But if no effusion takes place, and neither the bulk nor hardness sensibly decline, I have not found these hard and knotted testicles to irritate, inflame, and

render adherent the scrotum, and break up into ulcer and cancerous fungus, as might be expected, if their real character was scirrhous; and, indeed, I confess myself incredulous as to the fact of the scirrhous cancer affecting the testis. The scrotum, as is well known, is frequently the subject of such ulcer, in common with all parts of the cutaneous texture.

There is an equable and moderate enlargement of the testis, with condensation of the body and epididymis, in which the firmness is cartilaginous and the section of which presents smooth white gristly surfaces without a vestige of the glandular structure. Sometimes two or three small cells are seen containing serous fluid. A middle-aged gentleman consulted me for a testicle, moderately enlarged and much hardened, presenting an equable surface. The hardness extended to the cord. I endeavoured to calm his fears respecting the character of the disease, and advised him to employ further constitutional as well as local means for its reduction. He however soon became impatient for its extirpation, from apprehension that it was incipient cancer. It was removed, and corresponded precisely to the appearance last described.

The affection of the testicle, which has formerly been set down as cancerous, is the scrofulous abscess, which has its seat in the secerning pulpy structure of the gland, bursts up the close and loose tunics and scrotum from distension, and throws up a luxuriant rose-bud fungus, which gleets profusely at the aper-

ture. This has been well described and delineated by Sir Astley Cooper, in his late splendid work on the anatomy and diseases of this organ. It is a very common disease, but fortunately very curable in most cases without the use of the knife, and in all without the severe expedient of castration, which formerly, under an impression of its malignancy, was habitually resorted to. It frequently happens that both testicles are thus destroyed, one following at a short interval the course of the other. The disease is met with in young men of truly scrofulous habits, but is not confined to these.

The following is the ordinary scrofulous testicle, which is liable to be mistaken for scirrhus from its unyielding hardness.

July 5th, 1832.—James Sloat, æt. 25, a young man of spare habit, with blue eyes and light complexion. Rather more than six months ago, without any previous injury to the part or any description of venereal affection, the right testicle began to swell and the swelling shortly after was accompanied with severe darting pains, which were not confined to the testicle but extended down the thigh and upward in the direction of the cord. His constitution appears to have sympathised almost immediately with the local affection. The application of leeches and cold lotions to the part constituted the principal treatment previous to his admission into the house. At this time the testicle was about the size of a large swan's

egg, hard but very sensible to the touch, and giving a sensation of an increase of weight equal to that of volume when handled. Its parts were compacted together and its surface was firmly adherent to the integuments, which were tense and exhibited a slightly inflamed appearance. The cord was slightly thickened, the other testicle perfectly healthy. The weight of the tumour and the pain it gives him while in the erect position have confined him to his bed for two months, and his general health has suffered much in consequence. He is now in a state of great emaciation; is subject to night sweats and diarrhœa; has a quick and irritable pulse, and altogether a hectic appearance. He was ordered iodine medicinally and also as a local application, but finding the system injuriously affected by it and diarrhœa increased, it was soon discontinued, and medicine and diet prescribed, chiefly with a view of improving the general health, mercurial ointment at the same time being directed to be rubbed in.

July 30th. The patient's health has rallied, the pulse has improved, the secretions are more healthy, and the hectic flush has disappeared. There being, however, no perceptible change in the bulk of the testicle, it was removed by operation on the 3rd of August.

The tumour, which was the size of a swan's egg with flattened sides, the epididymis and body being inseparably incorporated, was very firm but slightly

elastic, and presented on bisection a dull white and seemingly smooth surface. Under water small cryptæ were apparent, and in some parts cysts and cells of various sizes plugged with straw-coloured or yellow matter. No vestige of healthy structure or colour remained. The tunica albuginea was slightly thickened, and in one spot raised into an hydatidal cyst. After three or four days floating in frequently changed water, one-half was incised in a direction oblique to the first section, and exhibited a bolder scale of abscesses in different stages of advancement, some holding solid (caseous), others fluid matter. The other half was subjected to gradual compression in the hand, and yielded readily so large a quantity of pus as reduced it to the ordinary dimension of the organ, without any læsion of its reticular texture. After some days of further maceration, a stream of water directed upon the cut surfaces demonstrated the body and epididymis to be each a complete nest of cells of different dimensions.

This is the indurated testis of scrofula, formerly reputed scirrhous, and removed under that impression. Its ultimate stage is the giving way by slough of the albuginea and ulceration of the superjacent skin, the fungus shooting through and overlapping the orifice. This was set down for the second stage (as in truth it is) of the disease, and denominated cancer, or cancerous fungus, of the testicle, and removed under that impression. The operation in the first case is called for if the constitution sympathizes, which is not always the

case; in the second it is quite unnecessary, as absorption is readily induced by pressure.

There is another case, in which the gristly condensation, giving the sensation of scirrhous hardness, presents on section a brownish mass, having no vestige of organization except being intersected by strong septiform processes, sometimes containing calcareous deposits, which grate against the knife. Anomalies without number might be described, as persons consulting the collections of this metropolis will find, but none bearing analogy to scirrhus as we see it in the breast, and other parts surrounded by cellular texture: the extreme condensation of this substance within the unyielding proper coat of the testis, unaltered in its properties, explains the symptom of induration.

The scrofulous inflammation of the testis also produces the pulpy enlargement which most nearly resembles the medullary fungus. It consists of deposits of white curd-like matter, intermixed with remnants of the brown tubular structure, and much thickened and softened coats; the consistence is what the name implies, and the disease is not painful.

I removed from the person of a medical man in this town such a scrofulous testis, of great bulk and weight, and presenting the flat sided or oval figure, with an homogeneous lardaceous section, a dozen years ago. He has since enjoyed excellent health. A boy's scrofulous

testis of great size was removed by my colleague, Mr. Tyrrell, after some difference of opinion as to the nature of the enlargement: he also did well.

The hæmatocele is a collection of laminated fibrine and grumous blood in the place of the gland, with thickened coats. This disease is not to be confounded with the bloody hydrocele, which is confined to the proper seat of hydrocele, and leaves the testis uninjured. Sometimes the close coat is enormously thickened, and in addition to decomposed grumous blood, contains, in the place of glandular structure, masses of dead lymph and pus in distinct cells, inflammation having recently existed. I saw such a testis freely incised, in consultation with the late Mr. Headington. There is sometimes disorganization of the testis from inflammation, consequent upon violence, as in the following case.

Jan. 1821. Smith, æt. 27, contracted a gonorrhœa two years ago, for which he used injections. It was followed by enlargement of the left testicle, and in this state that organ received a violent blow. It has since remained unreduced. The skin covering the testicle has recently become inflamed and burst under a poultice. The testicle protrudes in a sloughy disorganized state.

Jan. 19th. The part extirpated.

26th. Ligature of the spermatic artery separated.

Feb. 24th. Wound perfectly healed, and the patient discharged well.

The hydatid testis is a subdivision of the space before occupied by glandular structure into membranous compartments, containing a serous or albuminous fluid. There is sometimes great uniformity in the size and figure of the cells, the arrangement resembling a honey-comb throughout the whole interior of the tunic. In other instances their formation is confined to a part, or if pervading the whole, they are of unequal size and arrangement. Similar cysts often form external to the tunica vaginalis, and in the course of the cord.

No organ is more subject to medullary cancer; with this the scrofulous pulpy testis, above described, and the hæmatocele might be confounded by competent and attentive observers, were it not for the strongly marked characters of the malignant fungus. The two forms of the medullary cancer, which I have observed in the testicle are the brain-like (encephaloid) and the blood-like (hæmatoid). I have not seen these appearances combined, except where the testis, under a suspicion of fluid, had been deeply punctured, some time previous to an operation; and it was therefore only accidental. The rapid growth, enormous size, distension and discolouration of the integument; the weight, elasticity, almost amounting to fluctuation, and more or less involvement, of the cord; obtuse aching extending to the loin, the

complexion, temperament, age of the patient, and the disturbance of the general health, are the signs whereby to judge of its nature. Sometimes a collection of fluid in the seat of hydrocele co-exists with the fungus, but not often. Where the vaginal tunic of the cord, distended by the fluid, gives the impression of great thickening in that structure, and there is great lividity of the tumour from venous obstruction, and great uneasiness from volume and weight, the distinction is not always easy; and accordingly different opinions are entertained by different and experienced examiners. It is scarcely necessary to say that where such doubts exist, an incision of the tumour is the only mode of determining its character. But the history elicited by patient enquiry will generally determine the real character of the disease. I have more than once seen a supposed fungus turn out to be a complicated hæmatocele, and know at this time a case of four to five years' standing in which that mistake had been committed, the condition of the part and health of the patient having since remained unaltered.

The malignant fungus of the testicle greatly and rapidly disorders the health. If the part is extirpated and the wound heals, the patient retains his sallow aspect and general unhealthiness and pains, and the disease soon reappears at the groin, in the course of the cord. After death an enormous tumour of the same character is found occupying the iliac fossa, sometimes reaching even to the kidney, the pelvic and lumbar glands being involved in the disease. This is

also met with in other organs of the body. It sometimes happens that another and fatal disorganization takes place in the interval, before the reappearance of the disease externally. I removed the fungoid testis of a man in whom the cord was diseased quite to the ring, by slitting open the inguinal canal and tying the vessels within it, at a part where the spermatic process was unenlarged. The wound healed and he went about, though still complaining and looking sickly. Some months afterwards he called upon me, and whilst sitting in my waiting-room, died suddenly of apoplexy. I have never known an instance of the non-recurrence of the disease after castration.

Nov. 1821. Norris, a tin-plate worker, æt. 39. The left testicle has been enlarging for two years and the pain increasing. It is spheroidal, firm, but somewhat elastic; measures twelve inches in circumference; the cord much thickened, surface of the scrotum discoloured and vessels much enlarged upon it; health moderately affected.

12th. The testicle removed at his request. Appearance on section that of the genuine medullary cancer.

20th. He was taken ill of typhoid fever, and sunk rapidly.

24th. He expired. On examination, the wound had gone on well towards healing, the cord was found

diseased within the abdomen, beyond the spermatic canal; and the same morbid structure surrounded the ureter of the same side throughout the greater part of its course.

The scrofulous temperament, and the age from thirty to sixty, are in my experience most prone to it. The medullary is commonly a more shapely and uniform enlargement of the part, of less bulk and slower progress than the hæmatoid species. The former is most liable to be confounded with the pulpy or lardaceous testis of scrofula, the latter with the complicated hydro-hæmatocele.

THE PENIS.

In this organ the result of our experience is reversed; I have never seen it affected by the medullary species of cancer; it is very subject to the scirrhous. The origin is either in the glans or prepuce, though, in whichever it arises, the other speedily becomes involved. It is remarkable, however, how seldom the primitive ulcer in the glans is clearly ascertained, owing to the circumstance of its being in a great proportion of cases concealed by a phymosis, natural or morbid. Mr. Hey pointed out the liability of persons having a natural phymosis to this disease, and mine confirms his observation. A very sufficient reason, if there were no other, for never permitting the state of phymosis, congenital or morbid, to continue, if sufficient to interfere with the complete

denudation and necessary cleanliness of the cervix glandis. For the confinement of the natural secretion, however unimportant to persons of slovenly habits, is a circumstance easily convertible at any time into a source of mischief, but especially in age. I have several times known elderly men come into the foul ward for what was supposed to be a gonorrhœa with phymosis, in whom the peculiar induration of the glans, felt through the integument, led to a discovery of the cancer penis, for which immediate amputation was required.

The prepuce is subject to a warty cauliflower fungus, within which the glans is found, upon exposure, shrunk and entire; at a more advanced stage it becomes diseased, and incorporated with the fungus. Again, I have seen the ulceration confined to the glans, and the inflamed prepuce thrown back, and discoloured by excessive distention; and although I never saw a Jew the subject of cancer penis, I have operated on a man who had been cut for phymosis ten years before, in whom a pimple on the side of the frænum ulcered, and assumed the form of cauliflower fungus completely environing the glans, while the latter remained sound. The pain of this disease, as ulceration advances, is very acute at intervals, and always present in a distressing degree. There is commonly much tumefaction of the organ, and great hardness extends along the corpora cavernosa and septum penis, and advances, not very gradually, to the os pubis. The glands in the groin are as often

unaffected as otherwise. Swelling, hardness, preternatural redness, pimpling, excoriation, ulceration, deep, jagged, and sloughy, condensation of all the surrounding texture, so that the callosity extends far beyond the ulcer, with shooting and cutting pains through the organ, are the signs of incipient cancer penis. The production of fungus is accidental, like that of warty excrescences in general. It depends on mechanical confinement and a narrow aperture, through and around which the fungus shoots. Whether the glans or prepuce is first affected, the disease in its progress incorporates them, so as to blend them indistinguishably and destroy both. The discharge is copious and very fetid. If the penis be amputated at some distance beyond the hardened part, and before the disease has long existed, the patient may escape a return of it; but this is a rare instance of good fortune. Slight symptomatic enlargement of the glands in the groin should not be accounted a bar to the operation; on the other hand the absence of all glandular affection is no security against its return and fatal termination in three months. I hold it to be quite useless to remove the prepuce alone in any case of malignant sore or excrescence, however the glans may be free from ulceration.

The warts of gonorrhœa cannot, while they retain their peculiar character, be mistaken for the cauliflower cancerous fungus, I should think, in any case; but there is an intractable fungus of the prepuce as

well as ulcer of the glans, strictly speaking, neither venereal nor cancerous, occurring in younger men, as from the age of twenty to thirty, for which, owing to the extent of the disease and the utter irrecoverableness of the parts, amputation is advised and commonly resorted to; the complaint, however, is so connected with or depending upon organic visceral disease, indicated by advanced hectic, that the life of the patient is scarcely prolonged by the operation, perhaps abridged. I have amputated the penis once for cauliflower preputial fungus, and once for an inveterate sloughing ulcer, which began in wart on the upper part of the glans, for men under twenty-seven years of age, and in both death speedily followed, and the lungs were found loaded with tubercles, the hectic having been erroneously supposed to depend on the external disease. One died suddenly of serous effusion upon the brain, the other after a diarrhœa of three days' continuance. I believe this disease has its origin indirectly in gonorrhœal warts, concealed and encouraged by unrelieved phymosis, and that the unmanageable character is depending on established hectic. The following case exemplifies its commencement.

Nov. 1st, 1826. Thomas Moynhihan, æt. 38, has a phymosis which ensued upon a gonorrhœa five years ago. Within the last three months a thin pus has exuded from the orifice of the prepuce, and he complains of slight lancinating pains at intervals. The glans penis may be felt to be enlarged and harder

than natural, and is tender on pressure. In each groin are two small indurated glands. For some months past he has been troubled with short breathing and cough, and loss of appetite and of flesh. He is not accustomed to drink. His pulse is commonly one hundred and twenty, small and sharp—bowels costive—skin harsh and dry.

Dec. 1st. The prepuce was freely divided: two anterior thirds of the glans were covered with warty excrescences, having a broad base, the posterior third was much indurated. He was advised to have the part removed, but finding his health declining, he refused to submit and left the hospital.

Wherever the disease begins in irritable pimple, whether of the glans or prepuce, and this breaks into hard based and spreading ulcer, with a disposition to fungate, the case must be viewed with great suspicion, whether the glands in the groin be affected or not; especially if the patient be turned fifty years. If, on the contrary, the warty excrescence of the prepuce or glans be its original character, though it may be necessary and judicious to sacrifice the latter, there is reason to hope that the operation may be permanently effectual, as I have often found it to the extent of my after-acquaintance with the case.

The disease, after amputation of the penis, sometimes re-appears upon the stump, or forms cancerous buboes in the groin. The first happened in the case

of an elderly gentleman, for whom I amputated the organ quite beyond the morbid structure, but which in less than three months re-appeared and destroyed him, the external glands being nowhere affected. The second in a publican, æt. 64, in whom the disease commenced in a pimple at the corona glandis, the size of a pin's head ; it enlarged in eighteen months to the size of a silver penny ; it then broke and excoriated the whole surface of the glans.

March, 1826. The following was the appearance: The depth of the ulceration is varying at different parts of the surface, a part is covered with very minute conical granulations of a vivid red hue, much smaller and harder than healthy granulations ; with these are interspersed here and there patches of a yellowish white cuticle, hard and firm, and altogether equal to half the area of the sore. Between the ulcerated glans and prepuce is a fissure, a quarter of an inch in depth, and lined by the same kind of pellicle as that on the glans. The glans is enlarged and feels hard ; the prepuce swollen and retracted. There are two superficial detached ulcers on the prepuce, and the ulceration of the glans runs a short distance over it at their junction. The discharge is sanious, not very abundant, but very fetid. He has a good deal of shooting pain. On the scrotum are two superficial spots of ulceration, produced apparently by casual contact. The glands in the groin are not in the least degree affected. The scrotal sores healed readily.

18th. The penis was amputated full two inches above the glans.

April 15th. The man was dismissed in all respects well. In the following August, two or three glands in the right groin swelled and became painful, and about the end of October one ulcerated, for which he was re-admitted.

Nov. 18th. It is now a deeply excavated ulcer, the upper edge sharp and undermined, the lower reflected, and overlapping the sound skin. It discharges a thin fetid sanies, and he has slight shoots of pain. His complexion, flesh, and health are much altered.

January, 1827. The ulceration has much extended, the other inflamed glands having opened and the openings coalesced.

February. The chasm is large, the edges having been destroyed; the surface clean, the discharge more offensive. The left groin is now swelled, the skin discoloured, and a small aperture emits a dirty fetid pus. It is needless to describe the remaining changes.

March 14th. He died extremely emaciated, having been delirious nearly a month previous to his dissolution. The post mortem examination showed several lumbar glands in a similar state of enlarge-

ment and disease, containing an ill-conditioned, offensive pus. The liver was also much enlarged and very thickly studded with small hard white tubercles.

I never saw an instance in which the penis was affected with the medullary or hæmatoid cancer, and I doubt if it is subject to this fungus. Sometimes the cancer is translated, or remains stationary at least in the penis, and becomes active in the absorbent glands, and thus destroys the sufferer; and it is remarkable, that though the scirrhous cancer has been the original affection, as in the penis, the fatal issue of the case has developed only the medullary, as in the lumbal glands.

April, 1825.—Macguire, æt. 52, six months ago had a hard pimple, afterwards a sore on the frænum præputii. On this a partial phymosis ensued, with a whitish discharge from beneath the prepuce. Then a swelling arose in the right groin, and soon afterwards in the left. These swellings inflamed and burst, and in December, 1824, being unable to work, he applied at Guy's Hospital; being in part relieved, he returned to his work of unloading ships at Gravesend. The following month he was admitted into a foul ward at St. Thomas's, with what was supposed and stated to be gonorrhœa, with enlarged and indurated buboes in each groin. Upon more strict examination, the man positively denying the venereal origin of the disease, and his health being much deranged, the prepuce was found to be permanently

adhering to the glans, and from the small opening at the frænum issued an ichorous and fetid discharge. The glans and corpora cavernosa were indurated through half their length, and cords of indurated absorbents could be traced along the sides of the penis to the pubes and glands of the groin. The tumour in the right groin softened, pointed, and was punctured; blood only issued. From this opening ulceration extended in all directions, until a deep and extensive cavity was formed, having a peculiar, florid, velvet-like granulation. In the left the ulceration commenced by pinhole openings, which gradually coalesced, till a hollow sore, similar exactly to that of the opposite side, was formed. The malignant character was strongly expressed in both sores, and a sallow countenance and decaying health confirmed the opinion.

In February, 1826, he died after frequently recurring hæmorrhage. The pelvic and lumbar glands were found upon inspection to be amassed and enlarged into a considerable tumour, which upon section proved to be made up of sacs filled with a cream-like fluid, and bearing the character of the medullary, not the scirrhous carcinoma.

SCROTUM.

I may here shortly notice the cancer scroti, or chimney-sweeper's cancer, which is a peculiar form of malignant ulceration, more truly local than any in its origin. But although it is impossible to discon-

nect the origin of this sore and the occupation of the patient, how seldom have we seen the boys so much employed in this trade, the subjects of it; their wounds and excoriations shew no tendency averse to healing. The soot irritates in the adult to the formation of a hard pimple, which passes slowly through the stages of suppuration and scabbing to ulceration. The edge is hard and gibbous and everted, the surface of an ochre-red hue. The disease resembles the lupus of the cheek and eye-lids in destroying the skin and cellular texture, leaving the testicles and ligamentous covering of the crura penis, as that does the sclerotic, bare and wasted, but otherwise uninjured. This sore has no tendency to slough or penetrate deeply by ulceration. The lymphatic glands are rarely and seldom specifically affected. The disease returns after extensive removal. I have operated three times on the same patient, applying the actual cautery on one occasion after excision. The patient dies hectic, tabid, and commonly exhibits pulmonary tubercles, or the small white tubercle of scrofula on the serous membrane, either of the chest or abdomen. I am very doubtful of its identity with scirrhous cancer. The natural secretion confined by the soot, which obstructs the sebaceous follicles and exhalant orifices, becomes an irritant, and gives occasion to the inflammation: but the age and perhaps the habits predispose to the malignant character, which renders it incurable and ultimately fatal. The disease is of very variable activity, sometimes occupying years in its progress.

Sept. 1821. Woolley, æt. 43, chimney-sweeper. About three years ago a pimple appeared on the scrotum, which he picked; it became excoriated, then ulcerated. His health was not affected. He underwent an operation for its removal in the Westminster Hospital; the disease reappeared, and it is now an ulcer equal in size to a palm's breadth.

Oct. 11th. I excised freely the diseased edges of the wound, and then applied the actual cautery to the entire surface, leaving the wound to granulate. Portions of the crura penis were unavoidably denuded, and the tunica vaginalis was opened on both sides.

Dec. 12th. The healing went on slowly, but was completed in two months, so that he was discharged cured.

In the ensuing summer the man returned with a relapse of the disease in the site of the cicatrix, and died exhausted after some months of severe suffering. His emaciation was extreme. It was remarkable that the testicles, though exposed and shrunk, were not affected by ulceration; on inspection, the entire peritoneal surface was found studded with the small white tubercle of scrofula.

THE PROSTATE GLAND.

I found the prostate occupied by a tubercle possessing all the characters of scirrhus, upon section, in

an old nobleman long subject to retention. I have also met with cases, in which the stony hardness, and increased size of the gland, the bloody seminal discharge, and the peculiar pains of the thighs and elsewhere of women affected by scirrhous uterus, confirmed the opinion. Such a case I saw lately, with Mr. Brodie, under the care of Dr. Smith of Maidstone.

CLITORIS, NYMPHÆ, MEATUS URINÆ.

I have known the clitoris the subject of scirrhous ulceration, and freely amputated. The orifice of the meatus urinarius is in females of a certain age liable to scirrhous inflammation. The excrescential growths of these parts, as detached caruncles, vascular, and exceedingly painful; the indurated pendulous prolongations, sometimes of great bulk, and hard warty tubercles of the clitoris and nymphæ, involving the labia pudendi in their growth, have nothing malignant in them. The last mentioned are generally the result of venereal irritation. The inflammation which attends upon the small hard tubercles and caruncles of these parts, or the morbid irritability they set up, is sometimes followed by a permanent constriction of the vagina, or a spasmodic action attended with so much pain as to oppose a complete barrier to sexual intercourse.

The perineum and inguina are subject to cancerous growths. The removal of a large fungus from the

perineum was followed soon after by one in the groin of an elderly lady, of which the specimens are preserved in Mr. Hunter's collection.

May 7th, 1818. Mary Steer, an aged woman, and till of late healthy, though long suffering from piles, perceived, four months ago, a hard knot or kernel, as she terms it, in her right groin; it inflamed, burst, and gave origin to a warty excrescence, having all the complexion, discharge, and fœtor of a cancerous fungus. It gradually extended along the absorbents, from the groin to the anus, which it nearly encircled. The neighbouring skin was inflamed, and some glands in the opposite groin hardened and tender on pressure. No tumour could be traced within the abdomen. She has frequent burning and shooting pains, and complains of broken rest and loss of appetite.

July 24th. She died, having been rapidly sunk by a violent diarrhœa.

I do not remember to have seen the external organs of the female affected by the medullary or hæmatoid cancer.

THE UTERUS.

No organ is more frequently the subject of the scirrhous cancer than the uterus. When it occurs in young women, which it sometimes does, I believe it

is often, partially at least, referable in its commencement to violence, inflicted by disproportionate and intemperate coition, other circumstances combining to impair the health and weaken the powers of a system not naturally robust. I watched a case through its career, in which there was strong reason for entertaining this opinion. The disease begins in the lip of the os tincæ, or the angle of reflection of the vagina on the cervix, and extends to the body. The same part is subject to chronic inflammation and to simple scrofulous and venereal ulceration. I knew a case in which a large ulcer, considered cancerous, healed, and the woman recovered speedily under a course of mercury, the supposed cancer being a venereal ulcer. The symptoms of cancer uteri are well marked, and well known. The age, the character and seat of the pain, immediate and remote, and of the discharge, especially its peculiar fœtor and frequent admixture with blood; the early sympathy of the constitution, shewn in the pallor, the loss of flesh, rest, &c., cannot be overlooked.

The fleshy tumour of the uterus, sometimes of enormous size, is in no sense a malignant, though an incurable malady. It remains many years stationary, and considering its size and hardness, it is extraordinary with how little inconvenience from pressure, or displacement, to other organs of the abdomen. It is very sparingly organised, though it grows in the walls of the uterus. I have seen it oftener in single than married women; sometimes complicated with

ascites, sometimes with ovarian dropsy, and more frequently single, and uncombined with any other form of disease.

The ovaries form similar solid tumours as well as cysts, and they are generally more or less combined. One or more solid tumours are commonly felt in addition to the collapsed walls of the cyst or cysts, when the ovarian fluid is discharged, and the abdomen consequently flaccid.

Polypi of the ordinary kind are easily distinguished and removed in most cases. They are firm, fleshy growths from the lining membrane and body; and the lip of the os tincæ embraces their necks. One species, first described by French authors, growing from the surface and not from a point, is said to be malignant; it is pulpy in texture and easily broken down, and if removed, speedily regenerated. I believe it is essentially similar in character to the malignant fungus, before described, of the nares and antrum.

A warty tumour has been called the cauliflower excrescence, and a peculiar ill conditioned phagedenic sore, the sloughing ulcer of the uterus. The progress of cancer uteri is to affect the pelvic glands and contiguous textures. All the surrounding parts become compressed during the enlargement, then adherent; and if the patient survives long enough for the ulcerative process to extend to

these parts, the diseased mass is with difficulty made out. The irritability of the stomach, which rejects all nourishment, is one of the most distressing and difficult symptoms to assuage. The combination of scirrhous pylorus with the cancer uteri is by no means unfrequent. It is rare for a cancer to begin in the sides or fundus uteri, but it sometimes happens. In the cancer uteri the disease begins in thickening with rigidity and ulceration of the reflected vaginal membrane, which extends to the fleshy substance of the organ. In the cancer of the pylorus and rectum, of which we shall speak presently, the disease begins in a deposit between the coats of the bowel, and the mucous membrane is secondarily affected.

THE OVARIES.

I lately examined a specimen of this disease as it appears in the ovaria. It had been taken from the body of a female of 35 years and of decidedly scrofulous habit, who died after the birth of her seventh child. The displacement of the uterus by the rapid enlargement of the right ovary within the pelvis, and of the left, perhaps consecutively, in the abdomen, was such as to present alarming impediments to delivery when the period approached, as the os tincæ could not be felt. Fortunately the escape of the liquor amnii righted the malposition so far as to allow of the delivery of a dead child. The abdominal tumour was much the larger of the two, owing to its free space for growth. The ascites which accompanied

the disease symptomatically, was relieved by operation four days before the death of the lady, which took place ten days after delivery. Innumerable small tumours, like clusters of grapes, were attached to the larger masses; the section of both the small and large tumours everywhere presented the hæmatoid fungus character. The pylorus was constricted and surrounded by a genuine scirrhous tumour, and the pancreas was enlarged and indurated. It is remarkable that this lady's mother died of the ordinary form of cancer uteri during the formation of this disease, and that she had been employed in nursing her mother, when the first symptoms occurred *.

KIDNEY AND URINARY BLADDER.

The surface and cortical substance of the kidney is occasionally affected with medullary cancer. I never saw it scirrhous, but a scirrho-cancerous fungus of the ureter I have twice seen, filling and covering its aperture into the bladder. There is a malignant medullary fungus of the mucous coat of the bladder, resembling that of the nares and uterus, breaking and bleeding, and reproduced as quickly as it is displaced. It is of very extensive attachment, and gradually reduces the cavity to a very small dimension. Portions of fungus and coagula of blood

* An interesting narrative of this case is given at page 226 of this volume by Mr. Hewlett of Harrow, the lady's medical attendant; whose intelligence, assiduity, and benevolent feeling were equally remarkable under very trying circumstances.

become plugged in the urethra, and form firm pellets, so as to produce retention. It is a very painful disease, keeps the patient in constant anxiety to void urine, which is more or less tinged with blood, and frequently he passes blood alone. He dies hectic and wasted.

I never saw scirrho-cancerous ulceration of the bladder; scrofulous often, particularly in children. When the bladder adheres extensively to the rectum in the cancer of the latter, and when they communicate by a fistulous aperture, so that air passes by the urethra as well as fæculent urine, I have not seen the coats of the bladder presenting the appearance of scirrhous cancer. The vagina and rectum in the female, are, on the contrary, indistinguishably affected by the scirrhous ulcer and fungus. The prostate, as before noticed, is the subject of scirrhous enlargement and ulceration, but the disease is proper to the gland. I am not aware that it is ever affected by the medullary tumour.

3dly. The viscera of the chest and abdomen :—

THE PLEURA.

The pleura, both costal and reflected portions, gives origin to the medullary as well as the scrofulous tubercle. It is firm, and on section commonly exhibits an ash-coloured nucleus. The tubercles are in innumerable clusters and varying in size from a

pea to a small orange. In these cases the lungs are compressed, their cells more or less obliterated, and the dropsical effusion is considerable. In such a case I have drawn off many ounces of serum by paracentesis, to relieve the urgency of the symptoms. The rapidity of the formation of these diseases is the most extraordinary circumstance connected with their history. I have known a case in which, six weeks prior to the actual inspection of the disease, the patient had been engaged in strong athletic exercise, and had all the enjoyment as well as appearance of perfect health.

The appearance of this tubercle after carcinoma mammæ, and other scirrho-cancerous affections, as well as subsequent to medullary tubercle of the external organs and surface of the body, which I have seen in several instances, proves beyond controversy the natural relation existing between the scirrhous and medullary cancer, and that they are the offspring of a common parent.

THE HEART.

I found upon the anterior apex of the left ventricle of the heart of a gentleman, who died suddenly with symptoms of angina pectoris, and whose body I examined with Mr. Parrott of Clapham, a fungoid growth, elevated, and of the diameter of a shilling. It had the true pulpy character; there was no ulceration, nor any corresponding appearance on the loose

pericardium, or elsewhere. The internal membrane was unchanged, except some earthy deposits about the aortic valves.

THE ALIMENTARY CANAL.

The alimentary canal is subject to scirrhus, especially the lower orifice of the stomach, colon, and rectum. It is also the subject of medullary cancer, chiefly the œsophagus, upper orifice of the stomach, and about the termination of the small in the large bowel. The local origin of these affections is different, whence may be explained the different liability of parts of the same continuous canal. The matter of scirrhus is deposited in the cellular membrane, between the peritoneal and mucous coats, which forms the " couche " of its muscular fibres and blood-vessels. This, as it increases, encroaches upon, constricts, and renders tortuous the canal. Then the mucous coat partakes of the inflammation, its villous texture becomes indurated and rugged in some parts, ulcerated in others. This is the character of the scirrhous pylorus, sigmoid colon, and rectum. On section the scirrhous deposit appears of a dingy white, disposed in transverse radii perpendicular to the axis of the bowel.

Scirrhous fungi also form within the large bowel and destroy by obstruction, like strangulated hernia. They appear to belong exclusively to the cylinder of the bowel affected, no adhesive inflammation being excited in the surrounding peritoneum, so that they

may be moved in the abdomen, more or less, according to their situation. I examined such a case, some years ago, with Dr. Babington and Dr. Williams of Guildford Street, of which the following are the particulars.

Aug. 16th, 1821. Inspection of Mr. D.'s case twenty-four hours after death. The extremity of the ileum, where it enters the colon, was drawn into a large and solid mass, formed by the cæcum and caput coli. There was some discolouration of the surrounding peritoneum, and serous effusion into its subjacent cellular membrane, but no adhesions either to the other bowels, or except at its base, to the lining membrane, so that the tumour could be freely moved towards the umbilical and epigastric regions. After removing and laying open the caput coli, a conoidal, livid coloured tumour, hard, nodulated, and at one part deeply fissured, equal in size to a man's double fist, was found completely filling the cæcum and colon, covering the valve at its base, and adhering firmly to it, and to the mucous surface of the bowel around it. I also saw a gentleman, with Dr. Hue and Mr. Brodie, whose case, in external circumstances, as nearly as possible resembled this, but in which no examination was obtained. The tumour was situated, so far as we could judge, in the left extremity of the transverse colon.

A tumour of this description sometimes forms within the rectum, but this is rare.

The medullary tumour is situated exterior to the alimentary tube, the walls being free of the disease, except as affected by progressive ulceration, and the canal becomes fistulous, as when enveloped in a common abscess. The subjoined is an abridged note of what was observed by an anatomist of much celebrity on inspecting the body of a gentleman æt. 50 years, of strumous habit, who died with symptoms of organic disease of the stomach after a short illness.

Two distinct abscesses were found in the canal, one of the œsophagus, discharging into the posterior mediastinum by ulcerated openings in that tube; the second, comprised between the cardiac side of the small curvature of the stomach, and the concave surface of the small lobe of the liver, which parts were adhering. This abscess contained two ounces of matter. In connection with each of these, but perfectly distinct from each other, were two fungoid tumours, one extending to about an inch from the cardiac orifice, where the œsophagus was ulcerated, and another involving the posterior half of the cardiac orifice, and extending several inches over the stomach. The diseased masses, though of the same texture, were not in the slightest degree connected. The right par vagum was much enlarged, and its branches so involved in the disease as to be traced with difficulty. The left par vagum was ulcerated through, after having given off the posterior pulmonary plexus. Serum and lymph in flakes were observed within the pericardium, and some fluid in the pleural sacs.

The cases published by Dr. Seymour in the 14th volume of the Medico-Chirurgical Transactions, of which I have seen several instances, I have been accustomed to consider scirrhous, not medullary tumour of the pylorus: in fact, the same disease as the scirrhous rectum.

Omental and mesenteric tumours are common, but not in my observation malignant.

THE RECTUM.

The scirrho-contracted rectum is one of the most distressing of human maladies. The change upon the mucous surface is secondary, the deposition in the wall of the gut, encroaching upon its calibre, renders it irregular, and more and more constricted. There is great soreness on introduction of the finger or a bougie, and a discharge of blood or purulent sanies follows. The patient suffers exceedingly from the passage of excrementitious matter, unless in a state of fluidity, and always from the action of the bowels. The involuntary escape of fæcal fluid and excoriation of the orifice sometimes occasion a fungous growth, environing the ring of the anus. I do not recognize the hard, isolated tubercles of the mucous surface, described by writers as a commencement of the disease; great puckering and ridge-like elevations are met with, and the finger is resisted and tightly constricted by the bowel, when introduced. The use of bougies is not only unavailing, but in the highest degree dan-

gerous. I have more than once seen a perseverance in the use of a bougie almost suddenly fatal, in one instance passing into the urinary bladder, and in another into the abdominal cavity. A melancholy example of this description occurred recently, in which the colon was penetrated by the bougie, and no stricture existed. A tallow candle introduced without any force, is the only admissible bougie in these cases. There are many symptoms which distinguish scirrhus from simple stricture, and other diseases of the rectum, as the peculiar pain of the thighs and groins, the fetid, bloody, and purulent discharge, the affection of the lymphatic glands, the age and complexion of the patient, &c.

The ring-like stricture or corded contraction of the bowel, which will break as the finger passes through it, central and equally firm on all sides, without any other change than a rigid state of the mucous surface, with a broad pouch, and perhaps a second stricture above it, is the result of slow, adhesive inflammation: a very troublesome, but a very palliable disease, and affecting the comfort rather than the life of the patient; but giving rise, if neglected, to the watering-pot fistula, or sinuses opening in all directions above the stricture. If higher in the bowel, the ulceration which ensues eventually opens into the abdomen, when it of necessity proves fatal, as I have several times seen.

Some years ago I was desired to visit a gentleman

with the late Dr. Pett, who had been long suffering from obstinate costiveness, and had now been, for many hours, absolutely obstructed. He was incessantly vomiting, the abdomen elevated and tense as that of a woman far advanced in pregnancy. After many attempts I succeeded in passing a strong urethral bougie, breaking every inch of the way through continuous adhesions of the sides of the rectum along its whole course, by steady and firm pressure. Having obtained this advantage, I enlarged the size, and at length diluted it sufficiently by candles to obtain an evacuation of nearly a pailful of fæculent matters and fluid. The relief may be conceived which the use of large unirritating clysters and the temperate employment of the bougie afforded this gentleman. Some months afterwards my friend Dr. Laird was called to him at Brighton, dying under symptoms of ileus, and as the bowel had been kept free as far as it was within surgical reach, secondary strictures were naturally suspected, which proved, on examination, to be the case. There was much disease in parts of the mucous surface of the canal, and above a higher stricture, ulcerated apertures had permitted the escape of the matters into the abdomen.

There is an acute adhesive stricture of the small bowel following an enteritis, which I have seen fatal in a few hours, from sudden effusion, in two well marked cases in young people. The passage is reduced to the diameter of a straw, and symptoms of

acute hernia or volvulus are followed by those of effusion, viz. excessive uniform tension and racking pain, which admits of no relief.

Stricture sometimes occurs from an excessive morbid growth of fat exterior to the rectum, and terminates fatally by ulcerated apertures into the belly; of this I preserve a beautiful specimen. Also from the pressure of a collection of blood poured out by the hæmorrhoidal vessels, a species of false aneurism exterior to the bowel; from an enlarged and indurated prostate, and from a diseased and adhering uterus. Spasmodic strictures are very common, particularly in women, and often mistaken; their fæces, when solid, having the narrow ribanded and sharp-edged figure; they are curable by the temperate use of the bougie and cold water clysters. The metallic cylinder, temperately used, is the best bougie, and indeed the only useful instrument in all strictures complicated with spasm, as is illustrated by the old fable of "The viper and the file". Such persons however being, from experience, aware of the necessity of loose motions, and much in the use of injections, suffer but little inconvenience. When the case is a rigid permanent stricture, it is a source of real distress.

There is a very firm cartilaginous stricture of the rectum, which is in no respect malignant, and yet admits of no permanent relief but division with the knife, and dilatation afterwards, persevered in steadily and for a

considerable time. I have seen this in young as well as elderly people, both in the sphincter and several inches beyond it, following inflammation of the coats of the bowel at a considerable interval of time, and aggravated by the habitual use of drastic purgatives to relieve costiveness.

Warm hip-baths, and opiate suppositories and injections, and cooling ointments, are the only local relief the cancerous rectum admits of. I know of no fungoid or medullary malignant tumour of the rectum; the nodulated scirrhous tubercle I have met with, resembling that above described as forming in the colon.

LIVER. SPLEEN. PANCREAS.

The scirrhous and principal varieties of the medullary cancer of the liver have been ably described and delineated by Dr. Farre, in his "Researches into the Morbid Anatomy of the Liver," under the titles "Tubera circumscripta et diffusa." No organ of the body is more liable to these diseases: I refer to Dr. Farre's as the best authority on the subject. The finest specimen of scirrhous tubercle of the liver (tuber circumscriptum of Dr. Farre,) I have ever seen, was taken from the body of a lady for whom the removal of a large scirrhous mamma had been most satisfactorily performed a year before by an eminent surgeon of London, with whom I had seen her in consultation. The spleen not unfrequently undergoes a simple pa-

renchymatous enlargement like the liver, but it is seldom sensibly indurated. I never saw it affected with scirrhous cancer, often with scrofulous tubercle, and occasionally the medullary tubercle. A case is contributed by Mr. Monteath, of Glasgow, to Mr. Wardrop's work on the Fungus Hæmatodes *, in which a tumour of this species extended from the groins along the lumbar vertebræ and communicated with the pancreas and spleen. This latter organ " was very large, weighing two pounds and a half, and was almost totally converted into the same medullary looking matter with the tumour." " The inguinal, iliac, and lumbar glands were all involved in the tumour." Scirrhous pancreas is often mentioned, though with what propriety is doubtful, although the pancreas is subject to induration and enlargement. I have seen it involved in disease of the stomach and duodenum, but never the seat of cancer of either species.

4thly. Superficial regions:—

TRUNK AND EXTREMITIES.

Having now presented a sketch of the ordinary forms of malignant disease affecting the mamma, generative organs, and viscera; I proceed to consider those of the skin, cellular and aponeurotic membranes, and lymphatic glands. I shall first speak of the scirrhous cancer.

* Case 26.

This disease shows itself in all parts of the surface of the trunk and extremities, but in some more frequently than others. The textures in which it commences are essentially glandular, whether follicular as in the skin, or conglobate as in the lymphatic glandular system. The lymphatic glands, however, are more frequently affected secondarily, or by irritation propagated along the absorbent vessels, directing a remote morbid action, or conveying a morbid secretion. The fibrous and aponeurotic textures are also secondarily affected, as after the destruction of the entire integument, and thus become the beds of cancerous ulcers. This applies probably to the periosteum and membrane of the cancelli of bone, as well as to the fascia of muscle and tendon.

The regions of the neck, axilla, and groin are the most frequent seats of scirrhous cancer on the trunk, being especially the regions of glands. A very large cancerous ulcer occupying one side of the neck in the person of a farmer's wife in Sussex, has been some time under my observation. It is kept clean and inoffensive by the chlorate of lime wash, the health well supported by diet, and the irritation moderated by free doses of the extract of hemlock. This is an example of primary affection of the cervical glands.

The scirrhous affection of the axilla is but too frequently seen in the termination of the scirrhous mamma, and sometimes it is primary, but this is rare. The groin is affected subsequently to the generative

organs or to the lower extremity, in most instances; but here it is also sometimes a primary disease, as appears in the following case, drawn up at my request by my friend Mr. Estlin, surgeon, of Bristol.

Scirrhous Cancer of the Groin.

" The Rev. Dr. C. æt. 65, of a delicate constitution, thin and pale. He consulted me first in the beginning of the year 1829, and requested me to examine his groin, where he said there was a rupture, and for which he wore a truss. I could not discover any hernial protrusion, but found a gland enlarged and hard, above Poupart's ligament. I concluded there must have been a rupture at one time, as he had been seen by a surgeon of eminence in London and recommended to wear a truss. I advised the discontinuance of the truss, considering the pressure injurious. He complained of no pain in the swelling. He continued to call upon me at intervals until the 9th of June; the swelling became a little larger, but not painful; I applied mercurial plasters. He went to London during the spring and consulted Mr. Travers. I advised his going to the sea, and he went to Ilfracombe soon after his last visit to me on the 9th of June. He called on me again on the 24th of July. The tumour had then increased to a large size, extending in all directions, was very hard and knotty, inflamed on the surface, not very painful, but it obviously impeded his walking. I felt satisfied that the disease was of a malignant nature, one which would destroy him, and this was the first time I had even a

suspicion of the kind; before this change had taken place, I thought it not unlikely that the diseased gland would slowly suppurate. Dr. H. Fox, who occasionally saw him before his visit to Ilfracombe, was also unsuspicious of any thing serious in the tumour. On the following day I visited him with Dr. Fox; we ordered cooling lotions, as there was much heat in the tumour. I continued to attend him from this time to the 17th of December, 1829, when he died. The tumour increased, became excoriated, discharged much ichorous fluid, but never ulcerated, excepting this superficial ulceration; portions of the excoriated surface occasionally cicatrized. Two or three times there was hemorrhage from veins, not on the excoriated part, but upon the skin that was not abraded; the opposite side became affected with indurated glands; on the scrotum, penis, and on the thighs and abdomen adjoining the original tumour, were numerous tubercles which superficially ulcerated. Through the whole of the complaint he suffered no pain and did not take to his bed until two days before his death. The disease destroyed him by its effects on his constitution; he became extremely emaciated, had always a rapid pulse, and was never free from fever. His mind was clear to the last, and he was constantly employed in reading and writing. All the medicines and applications usual in such cases were employed without effect.

(Signed) "JOHN BISHOP ESTLIN."

When this gentleman visited me in the spring of 1829, I recognized the true character of the swelling

and drew the most unfavourable conclusion, though I did not suffer it to transpire, as he fortunately betrayed no anxiety. He also showed me a hard oblong tumour, of which Mr. Estlin makes no mention, which had appeared about the same time on the edge of the right pectoral muscle. This circumstance, and the strong resemblance of the inguinal swelling in shape and consistence to similar cases in aged subjects, fresh in my remembrance, probably decided my opinion.

Scirrhous cancer begins on the hand and foot; sometimes without any obvious excitement, sometimes after violence, either concussion or læsion.

Scirrhous Cancer of the Hand.

November, 1827. — Anne Adams, a spare old woman, nine years ago had a wart-like tumour, as big as a boy's marble, on the outer side of the fore finger of the right hand. It grew to the size of a walnut and then ulcerated, and a painful sore extended along the side to the base of the finger. In this state the finger was amputated by a surgeon in the country at the metacarpal joint. The wound did not heal but ulcerated afresh, and the sore crept over the back of the hand to the wrist and between the fingers to the palm of the hand. The appearance which the hand now presents is curious, being flexed to the utmost, so that the tips of the fingers touch the wrist. The entire dorsum is in a state of ulceration,

presenting broad fungous granulations which emit a copious acrid discharge. The integument of the arm is flabby, except the line of absorbents, which as well as the axillary glands are enlarged and indurated. The gland above the elbow-joint in the left arm is a hard tumour, resembling the original swelling on the finger. Her person is wasted, but her health moderately good. She complains of occasional lancinating pain, which is chiefly troublesome at night. Being unwilling to part with the diseased limb she returned to her home in the country.

Scirrhous Cancer of the Foot.

December 20th, 1827.—George Kimpton. Two years since a horse trod upon his left foot; the injury was attended by slight swelling and discolouration, producing lameness. The swelling continued for three months with pain at intervals for which vinegar and other poultices were employed. Within the last six months several small hard tubercles have appeared on the dorsum of the foot. Some of them are now in a state of ulceration and severely painful at night. The sore occupies the upper and inner part of the foot, superficial, irregular, covered with a yellowish tenacious slough, oozing sanious, toes œdematous. One inguinal gland enlarged. Appetite good. Tongue clean.

Jan. 5th, 1828. Limb removed below the knee.

10th. Stump healthy and granulating.

This patient left the house at the latter end of May following, as his health was suffering from confinement. The stump never perfectly cicatrized. The whole of the inguinal and pelvic glands had become enlarged, indurated, and very painful since the operation, and there was small probability that he would long contend with the disease.

A perpendicular section of the disease exhibited a dullish white mass of a cartilaginous hardness, particularly towards the centre, traversed by white lines. The disease adhered to the neighbouring tendons and ligaments, penetrating between the metatarsal bones, which were preternaturally soft throughout.

The integument of the trunk I have seldom seen the seat of scirrhous cancer. Several years ago, I removed from between the scapulæ of a middle aged female an elliptical portion of thickened skin, a hand's breadth in diameter, which was of a deep crimson colour, and covered with tubercles of a hardness like cartilage, and some ulcerating. Its appearance was suspicious, but I find her health has since remained undisturbed and the cicatrix firm.

When scirrhous cancer is seated in the aponeurotic texture, it is either a degeneration of the simple chronic ulcer, as the long standing sore of the lower extremities; or the breaking up of indolent and callous morbid textures, as warts, bunions, and old cicatrices, in persons having this diathesis.

An old lady who had extensive ulcers of the legs of many years' duration, and which had acquired a truly malignant aspect, was attacked with a cancer of the antrum and cheek, to which she speedily fell a victim. This, like many other cases of chronic ulcer approaching a state of healing, wore an appearance of metastasis, for it followed upon a more improved state of the leg ulcers and a much diminished secreting surface.

Scirrho-cancerous Ulcers of the Ancle and Heel.

July 1815. Henry Hendon has a large ulcer on the outer ancle of the right leg, its edges thick and everted, surface irregular, and bleeding on the slightest pressure. It has a profuse fetid discharge, and is attended by a burning pain. The origin of the sore was an injury received in India twenty-seven years ago. The increase of the ulcer and the pain, with obviously declining health, induced him to submit to amputation; which I performed on the 9th of August, a month after his admission.

Sept. 4th. The stump was healed, but the inguinal glands over the femoral vessels had become enlarged and formed a painful tumour.

30th. The swelling is now as large as an orange. The skin adhering, very thin, almost transparent, and discoloured.

Oct. 5th. A dark spot points at the centre of the tumour; it was punctured—a few drops of blood only followed the lancet.

10th. A fungus protrudes at the opening, and the disease extends under Poupart's ligament towards the abdomen.

Dec. 20th. The fungus now assumes the cauliflower appearance and occupies the entire hollow of the inguen. He is worn out with pain and loss of rest, and is wasted to a skeleton.

Feb. 13th. He died. I regret that I have no account of the post mortem examination.

A case similar in character to the foregoing, was that of William Stevens, mariner, whose ulcer is described "as of a truly malignant character, occupying the left heel and adjoining sole of the foot, the edges elevated, abrupt, and callous; granulations broad and irregular, of a peculiar dark hue, intersected by numerous filaments of the plantar aponeurosis; the discharge sanious and highly offensive. At the same time a livid-coloured tumour is seated in the right inguen as large as a hen's egg." This man soon after fell a victim to the disease. A third case I remember to have occurred under Mr. Forster, at Guy's Hospital, having been, like Hendon's, the subject of operation prior to the formation of the inguinal tumour.

I have also the particulars of the case of Robert Weir, whose leg I amputated in 1817, which though it had a favourable result as far as I observed it, was considered malignant, and I believe justly, being precisely the inveterate incurable ulcer to which the cancerous action often succeeds.

Seventeen years before he had ruptured the tendo achillis, and lacerated the integuments of the ancle-joint, in a fall from the mast head. The wound slowly healed, but has since repeatedly broke out afresh and again cicatrized, leaving the integuments of a livid colour. For five years past the tendon has been denuded, and since February of this year, the ulcer has become deeper and a severe lancinating pain is felt about the os calcis. At the time of the operation, July 18th, the ulcer was in length about four inches, communicating with the ancle-joint, several pieces of tendon and ligamentous membrane having sloughed. It is encircled by fungous florid granulations, some everted and others inverted, all rising high above the edges of the sore and discharging a fetid matter; the surrounding parts are painful to the touch—pain extends in distinct lines up the leg and there is an enlargement of the glands in the groin. He left the hospital with a sound stump, in August following.

Before quitting the class of scirrhous affections of the external regions of the body I have to observe, that there is a tubercle of the subcutaneous

cellular membrane and skin, which appears distinct from any morbid affection of gland or other organ, and which has its original and proper seat in the common integument. Instead of being of loose and pulpy texture, as the insulated medullary tumours, it is hard and unyielding, feels like an indurated gland, adherent to the skin, and appears in all regions of the body, from the scalp downwards. It does not ulcerate in my experience, though tender to pressure, and sometimes slightly tinted with colour. The section is firm, white, semi-organized, with a tinge of black in the centre; in short, it resembles the tubercle often seen upon the serous membrane, as of the pleura and peritoneum, in persons who die of carcinomatous hectic, as the persons so afflicted die, and in whose viscera I make little doubt these tumours would generally be found.

My attention was early directed to this affection, from having watched a woman named Fraser, who had these tubercles scattered over her whole body, and died emaciated to an extreme degree in Guy's Hospital during my apprenticeship at that institution. I regret that I have mislaid my notes of the case. This disease is denominated tuberculated sarcoma by Mr. Abernethy in his classification. I have since seen a similar case in an aged countryman, in which some of the many tumours were firm and incompressible, others soft, and the skin purple where it covered them. He was at that time very

gradually declining in health, which had been hitherto good.

The same description of skin tubercle is seen not only contiguous, but even in remote parts of the body, in some women who labour under scirrhous cancer of the breast. Their diffusion over the surface, and their analogy to the scirrhous tubercle of the liver, the uterus, and other viscera, combine to present the phenomena especially characteristic of the medullary cancer, in a manner not to be overlooked. I have repeatedly seen them upon the serous membrane of the chest or abdomen in combination with the genuine medullary disease of the surface, proving the common relationship of the species, and rendering it probable, that the texture or the temperament influence the external developement more than is generally supposed. In short I am disposed to consider such tumours as partaking the character of both species, and should name them scirrho-medullary tumours.

Cutaneous Medullary Tumours of the Arm and Trunk.

February, 1826. Bird, bricklayer, æt. 33, had from his childhood a pimple of the size of a pea between the thumb and forefinger of his left hand. The head of it was taken off by a wound with a chisel last spring; he was unable to heal the wound in consequence of a fungus sprouting from it, bleed-

ing on the slightest touch; he therefore got the part freely excised, and the wound healed. Now the glands of the axilla began to swell and became painful, and a tumour appeared opposite the inner edge of the biceps at the inner and upper part of the arm. Soon after which other similar tumours appeared on the anterior part of the forearm between the elbow and wrist, extending in a chain in the course of the absorbents down into the palm. Not long afterwards, others sprouted up about the elbow, extending upwards towards that which first appeared in the upper arm. The fungoid growth now re-appeared at the wound and was again extirpated, but the wound never afterwards healed; the growth was repressed by the strong nitric acid. The tumour of the upper part of the arm, of the size of a pullet's egg, was punctured, and discharged a transparent ropy mucus. Prior to the wound he had always had good health; but had lost two sisters by cancerous complaints.

February 16th. There is now a fungus of the size of a walnut protruding from the wound in the hand, covered with dirty white slough, and frequently bleeding; also a similar tumour in the palm; and extending from the wrist up the inner side of the arm a series of tumours, all possessing the same generic character, and varying in size from a pea to a walnut, all conoidal in figure, livid in colour, skin stretched to the utmost, and polished, and feeling as if they held a fluid. The axilla has likewise a conoidal tumour of the same kind. Lancinating pain

in the hand and arm occasionally, especially when touched. He was ordered small doses of sublimate with sarsaparilla.

26th. An attack of erythema extending over the arm and side to the last rib. Tumours increased in size and the whole limb exceedingly painful. Leeches and fomentations. Calomel and opium.

March 4th. Pain severe and increasing, appetite failing. Tumours increased in size. The points of the tumours ulcerating and a very fetid sanious pus discharging. Fresh tumours have appeared since, under the action of mercury.

15th. Mouth has been very sore, all the tumours increased, and likewise the fungi. More of the old tumours have ulcerated and fresh ones spring up in the neighbourhood. Mercury withdrawn.

22d. Pain prevents his rest and destroys appetite. Several more of the tumours have ulcerated and assumed the same characters as the others in which that process had occurred, viz. the formation of conoidal eminences, the apices occupied by a sloughy fungus continually discharging a fetid sanies. Three or four contiguous swellings have united by ulceration into a common fungus near the elbow. Patient's appetite, strength, and spirits failing. Wine and opium.

25th. A fresh and more severe attack of the in-

flammation, of the axilla and side of the chest, before mentioned.

30th. The sloughs are casting off and the wounds look cleaner, and more florid than they have yet done. The inflammation of the side continues and extends.

April 6th. All the fungoid excrescences have now a clean surface and discharge a tolerably healthy, though offensive pus; inflammation of the side extending. Takes scarcely any food.

12th. Sloughing process has returned. Tumours on the arm decreasing, their surfaces being thrown off; pain very severe, especially from the hand. Takes black drop at night.

17th. About a quarter of a pint of bloody matter discharged by the bursting of the axillary swelling followed by considerable relief. The whole side of the trunk inflamed.

23rd. There is now a continual free discharge from the axillary swelling; the fungi of the arm are flattened by sloughing almost to the level of the skin. The fungi of the hand bleed much, and are exquisitely painful. The inflammation of the side has disappeared.

29th. The stomach rejects nourishment and also

wine, which alone has supported him. He can take porter and drinks a quart per diem. Solution of opium to the arm and various narcotics tried ineffectually.

May 10th. The fungi all increased; bled this morning to the extent of a pint or more. A large tumour opening and extending from the axilla under the pectoral muscle. The integument on the radial side of the arm, from the hand to the shoulder, feels knotted with small tubercles, slowly following the course of those which have preceded them. The edges of the large orifice on the axilla fungating; the surrounding skin has a livid red colour like that of the tumours in the arm: a tubercle appears above the clavicle. Health sinking.

24th. A large sloughing fungus now protrudes from the opening in the axilla.

June 4th. Below the left angle of the lower jaw is a diffused, soft swelling extending downwards three inches, and exquisitely tender to the touch; it additionally impedes deglutition.

6th. Since the last report, a troublesome cough with hurried respiration has supervened, and frequent spitting of mucus mixed with blood; also frequent and free hemorrhage from the tumour.

7th. Died.

So great was the interest which the case excited, that the friends, to prevent examination, removed the body as soon as life had ceased, and pertinaciously resisted all solicitation to examine the viscera.

Cutaneous Medullary Tumours of the Abdomen and of the Mouth, Pharynx, &c.

May 1827. Onion, tailor, æt. 56, sallow complexion, and addicted to dram drinking, was admitted with ulcerated gums, proceeding apparently, and as he supposed, from carious stumps on the right side of his upper jaw. The teeth had been extracted, but he still suffered from the extension of the ulcer to the palate, and sharp pains shooting thence through the ear and to the top of the head. The alveolus on the right side, the back of the hard palate and the velum palati are swollen and covered with hard, pale, granulations. The inner membrane of the cheek has a circular ulcer with hard and thickened base and edges; he is quite unable to masticate and swallows with difficulty.

In the integuments of the abdomen are two adhering tumours, each the size of half an orange; the surface of one has a florid pink colour, the other, which is more extensively and intimately adherent to the skin, is purple and livid; these were discovered six months ago, and were then moveable, as is another of more recent appearance on the left side of the chest. No pain attends either, even on handling.

The ulcer of the mouth discharges a very copious, thick, and fetid secretion, streaked with blood. His pulse is 85. Tongue white with red tip. Belly costive. No appetite. Bad rest.

Various medicines and applications were employed to relieve his distress.

He became emaciated, and sunk under the disease, on the 23rd of July.

Sectio Cadaveris.—The ulceration extended very nearly over the whole palate, and the greater part of the bag of the pharynx. The front of the spinal cord adhering to the ligament; opposite the fourth and fifth cervical vertebræ, and in front of the right transverse processes, was an encephaloid tumour presenting a section similar to those of the abdomen and chest. These did not adhere to the fascia beneath them. In the fat surrounding the right kidney was a similar tumour, and several others were found in the mesentery.

The fourth plate (fig. 5 and 6,) of my "Synopsis of the Diseases of the Eye", exhibits the appearance of an eye, the subject of the melanoid fungus, which I removed in 1820. The patient was a Mr. J., a man of 42, who had enjoyed good health until the appearance of this disease in the eye. He recovered rapidly and most favourably from the operation, but some time afterwards the common integument became studded with innumerable melanoid tumours;

and from the irritation and wasting thence induced, he soon died. The body, I regret to say, was not examined *.

No region of the external surface is more subject to be visited by the medullary cancer than the cervical, pectoral, and axillary; and parts circumjacent to the shoulder joint. I shall present two or three of many cases that I have witnessed.

Medullary Tumour of the Neck.

William Weir, æt. 23. In the summer of 1830 first perceived a small lump posterior to the sterno-mastoid muscle after catching cold. It inflamed, and was treated by leeching, but never wholly reduced. In this state he went to sea, the tumour slowly increasing, but far more rapidly on getting into warm latitudes. Whilst at Bombay the growth became acuminated with an obscure sense of fluctuation; a lancet was plunged deeply into it, which was followed by a little venous blood. Subsequently, on the voyage home, the disease rapidly increased to its present size. The general health not materially affected. Habit spare, pulse rapid. Pain remittent, not usually severe. The tumour was the size of two fists, dense, very slightly elastic, occupying the superior

* A most extraordinary example of the universal diffusion of this variety of the disease commencing in the eye-ball was published in 1826, by Mr. Fawdington, of Manchester, well illustrated by coloured lithographic plates.

posterior cervical region, throwing up the tegument of the scalp as far as the occipital ridge; it presented an apex, or point, of a blueish hue, found on pressure to be the most yielding part of the whole growth.

In July of the present year (1831), a bold but well concerted attempt to extirpate the tumour was offered to the poor man as his only chance, by his surgeon, and my very able colleague, Mr. Green. It was executed accordingly, and by far the greater part was removed, but it was found impossible to eradicate the entire morbid mass from the situation and extent of its attachments, as will sufficiently appear from the dissection. He bore the operation with great fortitude, but after a few days sunk under symptoms of overwhelming constitutional irritation.

Dissection twenty-six hours after death.—The wound sloughy but contracted, having on its surface two or three fungoid growths, small and spongy, giving issue to a dark purple fluid on section. The situation of the disease was in that superior and posterior part of the neck bounded by the sterno-mastoid in front and the trapezius behind. Two processes of the growth, invested by a thin cyst, passed, the one portion downwards towards the posterior belly of the omo-hyoid and brachial plexus; the other forwards, beneath the belly of the sterno-mastoid, adhering firmly to the sheath of the carotid, just below the bifurcation of that vessel, which was itself loaded with adhesive matter at this part. The

calibre of both vein and artery was much narrowed. In the direction downwards, the attachments and bellies of all the muscles beneath the trapezius seemed converted into the genuine brain-like fungus, which had not been affected by the sloughing process. The occiput, mastoid process, and transverse process of the first cervical vertebra were quite bare and rough, the latter still having a few tendinous shreds of the obliqui hanging to it. The cellular substance of the face and neck was at different points, sloughy, purulent, or thickened; the patient had been attacked by erysipelas two days after the operation. All the salivary glands were very pale, but otherwise unaffected by disease. The thyroid gland was enlarged and very hard, presenting on section a glistening, resinous appearance. Two or three small fungoid nodules were found in the seat of the thymus. A soft medullary deposit was occupying the middle lobe of the right lung, central, its greatest diameter about an inch and a half. A similar substance was found in the cortex of the right kidney, which was preternaturally soft and flabby.

Medullary Tumour of the Axilla and Pectoral Region.

July 20th. Sarah Keene, aged 30, had suckled till her admission. A tumour had gradually extended from the axilla to the right breast which it now completely involved. Leeches, poultices, and soap plasters were employed, though it was not painful. In September a puncture was made into a

prominent part of the swelling, from the notion that it contained matter; from this blood only issued. A month afterwards as it was increasing rapidly, and was now a good deal inflamed, a deep and free incision was made into it, from which a quantity of grumous blood escaped mixed with some pus. Constitutional symptoms set in, the wound turned sloughy, and a livid red disc surrounded it. Under a gently supporting treatment the discharge became healthy and the breast diminished in size.

Nov. The discharge had ceased, but a hardness remained on the outer side of the nipple.

Dec. The symptoms of suppuration returned, and the wound again discharged and threw up a large fungous growth.

Jan. 1827. The fungus had acquired great size, and from a fistulous orifice just above it large bleedings took place successively; these were arrested by cold applications. A consultation overruled an operation, and applications to cause sloughing, as strong nitric acid, caustic potass, were resorted to.

Feb. Parts of the fungus have separated and the sloughing continues. She has a good appetite, rests well, and drinks two pints of porter daily.

March. The right arm is œdematous and painful. Her health is now giving way. Excessive weakness, bad nights, total loss of appetite.

April. All the glands about the neck are inflamed and very painful, and the œdema of the arm increases. Health much broken. The fungus has much decreased under the pulv. sabinæ, with which it is constantly sprinkled. The upper arm appears to be suppurating and is very painful from distension—frequent rigors.

May. The swelling extends to the fore arm and hand, and a slough appears on the back of the hand. In the course of this month the painful glands in the neck have suppurated and broke. The fungus has almost disappeared, and the appearance of the sore is not unhealthy. She is much troubled and depressed by diarrhœa.

June. Symptoms of exhaustion; occasional delirium; continual looseness. The fungus re-appearing early in July, she died.

Sectio Cadaveris. The tumour, of a dirty white colour and pulpy consistence, occupied the space below the clavicle and the seventh rib, sternum, and margin of the latissimus dorsi, passing high into the axilla. A deep sloughing ulcer occupied the centre of the tumour and the axilla; and upon making an incision through it, a mass of brain-like matter was effused. On dissecting off the tumour close to the ribs and the intercostal muscles, their fibres, which were flaccid and very pale, were found to be intermixed with small white masses of a firmer consistence, extending through the costal spaces to the

pleura. The pectoral muscle was destroyed; only the fascia covering its lower edge remained, much thickened. The principal bulk of the tumour was composed of the brain-like matter contained between thin membranous septa, with here and there a small collection of matter. The lung on the diseased side was uniformly and firmly adherent to the costal pleura. An abscess was found holding about an ounce of pus between the pleuræ near the spine, upon the edge of the diaphragm. The liver alone of all the viscera was diseased; it had numerous pretty firm tubercles, especially on the under surface of the left lobe. The glands at the bottom of the neck, under the clavicle, two or three in the anterior mediastinum and in the axilla were enlarged and indurated. A large slough appeared on the back of the hand, and numerous abscesses beneath the integument of the fore-arm.

Medullary Tumour of the Shoulder.

November, 1821. Harriet Bentley, a young woman well grown, of fair complexion, was admitted into the hospital with a soft equable swelling which had gradually formed around the shoulder-joint, reaching from the acromion to the insertion of the deltoid, and from the coracoid process in front beneath the teres and latissimus dorsi muscles, whence it had a prolongation into the axilla, so as very nearly to surround the joint. It was attended with little pain, and she was unable to refer it to injury. After staying some weeks in the hospital, and finding that the

means employed gave no check to the rapid increase of the swelling, and suffering more uneasiness than at the time of her admission, she returned into the country.

In the course of the following year she came again to the hospital in a hectic state, the tumour having attained an enormous magnitude, and the integuments in parts discoloured, as if on the point of bursting. She died: and the morbid growth on section presented the appearance of the hæmatoid fungus, with here and there detached collections of pus. The muscles and capsular ligament were blended with the diseased growth, and much changed in appearance, and the bone partially softened. The most remarkable circumstance, though not new to my observation, was the entire state of the synovial surface of the shoulder joint.

Medullary Tumour of the Axilla.

Mrs. C., a fair young Jewess of scrofulous temperament, soon after marriage noticed a soft moveable tubercle beneath the tegument of the left axilla not larger than a pea, the germ of a tumour which during her pregnancy increased, and still more rapidly after delivery, being now of a firm consistence, filling the axilla, extending backward over the entire dorsum of the scapula, and forward over the cartilages of the fifth, sixth, and seventh ribs. The head of the humerus is much elevated, and the left mamma is

completely involved in the swelling. The greatest circumference of the tumour is fifteen inches. She has invariably good health, and does not complain of pain or much inconvenience.

This note was taken with a sketch, in my possession, of the tumour in its anterior and posterior aspects. The disease went on to affect her health, and soon proved destructive.

Medullary Tumours of the Thigh.

May, 1819. Maria Trifnail, æt. 30, maid servant, a handsome well-formed person, says, that for twelve years previous to any appearance of disease the slightest blow or strain of the knee-joint has occasioned unusual pain. In October last a swelling rose above the inner condyle of the femur, was fixed, and attended with pain resembling rheumatism; she used all ordinary means, medical and surgical, to disperse or repress the growth of the swelling. She then became an in-patient of St. George's Hospital, where the part was leeched and blistered alternately for a month, but obtaining no relief, she returned to her friends. The tumour has since rapidly increased, involving entirely the circumference of the thigh for two thirds of its length, and reaching downwards to the tubercle of the tibia; its girth is twenty-four inches, length fourteen. The tumour is in some parts soft, elastic, very tender to the touch, and the seat of sharp lancinating pain; the integument is

discoloured by patches of a livid red irregularly interspersed. About two months ago, viz. six months after its appearance, an enlargement was perceived in the groin below the crural arch on the outer side of the femoral artery; it is the size of an egg, not so yielding as the larger tumour, nor so tender, bearing moderate pressure. The woman's countenance is pale and anxious, and of late she has become much emaciated; she procures sleep only by the aid of opium, though she has no distinctly formed hectic. After some time, the prospect of relief being daily more discouraging, she abruptly left the hospital.

I assisted the late Mr. Compson, of the Old Jewry, in a high amputation of the lower extremity of a tradesman in Norton Folgate, for a medullary tumour occupying the entire circumference of the thigh; the sciatic nerve passed uninjured through the centre of the tumour. His death followed soon after from disease in the chest.

A fine young man had a subcutaneous medullary tumour removed by Mr. —— from the front of the thigh; the wound healed kindly and remained sound. He died about three years afterwards from a return of the disease in the chest.

Medullary Tumour of the Ham.

In the spring of 1831, with the assistance of two surgeons of eminence, I removed by careful dissec-

tion a very large tumour deeply seated in the ham, i. e. immediately over its great vessels and nerves, of a delicate married woman of middle age. It had been about two years and a half in growth, and was from pressure upon the nerves become exceedingly painful. The pain was chiefly seated in the toes and outer side of the foot. The cavity left by the removal of the tumour, which occupied the lower half of the thigh as well as the ham, and was of some pounds' weight, granulated slowly, but soundly up. The patient gradually improved in health and soon afterwards became pregnant. The section exhibited the genuine character of medullary tumour.

1832. During the latter months of gestation this lady suffered severely from pain in the course of the sciatic and crural nerves, so much so as to render the use of the limb very distressing. This was attributed to the obvious circumstance of pressure, and she was consoled with the prospect of its being soon relieved. However on recovering from her accouchement, which was perfectly favourable, the incapability and more particularly the pain were greatly augmented. The latter was very little mitigated by opiates. It was accompanied with a sympathetic irritability of the stomach to such a degree as to occasion the almost constant rejection of food and medicine. The pain followed especially the course of the nerves, but was diffused so as to render the slightest pressure upon any point of the surface intolerable. The vapour-bath gave some relief, and internally, a drachm of the am-

moniated tincture of guaiacum with a few minims of the liq. opii, was, of many medicines tried, the most effective. There was a general but not considerable fulness of the limb as compared with the other, but no external indication of a renewal of the morbid action. The sea-side having been of great service in restoring the health and the use of the limb subsequent to the operation, she resorted to the same remedy on this occasion, and is now residing there. The pain, though much abated, is still felt on placing the foot to the ground; the health otherwise sound. It is remarkable that the mamma, shoulder, and loin of the same side partook, though in a less acute degree, of the pain of the extremity. There has been no delusion or benumbment of sensation such as pressure occasions; the whole character of the present complaint is neuralgia, and the only remedies affording any relief have been those of the tonic class.

Medullary Tumour of the Calf of the Leg.

August 18th, 1821. Joseph Wyman, æt. 18. His account was as follows:—A year since a small tumour appeared in the middle of the calf of the right leg: it gave no pain, but increased during nine months to the size of a large egg. It was then removed by excision, with a portion of the surrounding integument. In three weeks he began to walk about, the wound being imperfectly healed, and it threw out a fungus which has since bled frequently and largely. There is now a bleeding fungus evidently springing

from the fascia or fibres of the gastrocnemius muscle four inches long and three broad.

September 1st. The tumour was removed freely by an incision including the portion of the muscle into which it extended. Two arteries were secured and the wound dressed lightly.

20th. The wound has gone on kindly and the health is undisturbed. The granulations look healthy, level with the skin, and are on the point of cicatrizing.

A few days after this report the fungous character appeared in two or three distinct parts of the sore, and in a week became as large as walnuts, although rubbed with caustics in dressing.

October 2d. A small swelling in the groin.

9th. The fungous tumour much increased and irrepressible by escharotics. Health good.

16th. The limb amputated above the knee. On a section of the calf, it appeared that the belly of the muscle was half converted into the morbid growth which was deposited between its fibres in every direction, its interior surface remaining healthy.

21st. The stump dressed, very unhealthy, and gaping round the bone. No attempt at union.

23d. All the ligatures thrown off by slough, bleeding from the femoral artery, which was secured by a fresh ligature. Sore very unhealthy. Sanious discharge, no action in the vessels of the limb. The man was ordered bark and ammonia, opium, wine and good nourishing broths.

November 2d. Healthy granulations over the stump and the skin closed round, but a portion of the bone protrudes and is exfoliating, and prevents healing. Health much recovered.

December 25th. Suddenly attacked with violent pain in the abdomen with sickness; leeches and fomentation. Venesection; blister to the abdomen, saline aperients; fever diet, and mixture.

30th. Hypercatharsis. Mist. cretæ comp.

January 2d, 1822. A tumour in the right side of the abdomen, painful on pressure and gradually increasing. Bowels much relaxed.

9th. Was removed in a very debilitated state to his home: in four days after his removal he died.

Sectio Cadaveris. A large abscess was found betwixt the peritoneum of the muscles and that of the bowels on the right side of the abdomen; the colon, cæcum, and small intestines glued together by an adventitious membrane, forming one wall of it. There

was also a distinct abscess at the porta, the liver and diaphragm, duodenum and colon forming its sides. In the colon were found ulcerated apertures communicating with these abscesses. But no malignant appearance presented itself, nor were there any enlarged glands in the groin or loins.

Medullary Tumour of the Foot.

The following is the notice of a case by Mr. Delph, surgeon of Edmonton, in whose practice it occurred, and to whom I was indebted for the opportunity of treating it.

"June 5th, 1826. Jackson, æt. 21, a servant girl, applied to me for relief on account of severe pain on the outer side of her foot, which was very much increased by pressure; there was neither swelling nor redness. I ordered leeches to the part and some soothing medicines. She continued in her situation until the following October, when she was compelled by her suffering to leave it, and shortly afterwards a small round tumour appeared on the same spot to which the pain was referred. Leeches and fomentations were again applied without diminishing the swelling; there was every appearance and sensation of a fluid, but a few drops of blood only escaped when I punctured the tumour. Shortly after a fungus shot up from this opening.

"On the 7th of January, 1827, Mr. Travers re-

moved the diseased part including the metatarsal bone and phalanges of the little toe. On the second or third day after the operation, erysipelas came on and general swelling of the limb, with a tumour in the groin, which suppurated and afterwards healed. The swelling of the limb never subsided, and on the sixteenth of the same month secondary hemorrhage came on; the bleeding vessel was secured by ligature. Some time after, a fungus projected from the wound and other fungi appeared on the dorsum of the foot; the discharge from the wound was copious and unhealthy, and it shewed no disposition to heal. The inguinal and cervical glands became enlarged to the size of hen's eggs. She lingered until the 29th of March.

"*Sectio Cadaveris,* March 30th, 1827.—General emaciation of the body—the inguinal and abdominal glands presented the appearance of one immense mass of fungus within and around the pelvis, and the whole lymphatic glandular system was similarly, more or less, diseased.

"(Signed) N. Delph."

OSTEO-MEDULLARY TUMOURS.

The anatomical museums present specimens of fungi springing from various parts of the osseous fabric. The bones of the face, the orbits and maxillæ, the ribs, ossa innominata and bones of the extremities, especially of the lower, are those most frequently so

affected. Of these the greater number are to be considered as of an innocent, however intractable, character: and the softening of the shell, its ulceration, and the abscess of the cancelli of bones whose texture is broken up by the encroachment of malignant tumours, whether scirrhous or medullary, is not, in many cases at least, to be considered other than as a local and contingent circumstance. The remarkable facility of fracture pervading the bones of cancerous subjects, seems to shew that their texture undergoes a specific change, since the phenomenon is peculiar to this class of diseases; and the fungus springing from the orifice of a bone, as the tibia, in the centre of a cancerous ulcer, has often the identical character of granulation that belongs to the soft parts, and not that which we familiarly call bony granulation. I am, nevertheless, rather disposed to regard the morbid changes which we see in a bone involved in scirrhous tumours or ulcers of the soft parts, as secondary, and the legitimate results of absorption from contiguity and pressure, than as evidence that the bone is ever primarily a seat of scirrho-cancerous ulceration.

But when we see a bony swelling presenting as its external character, a roundness and diffuseness, so to speak, as nearly analogous as its texture permits to the medullary tumour of soft parts, increasing in size and gradually becoming spongy, eventually so elastic as even to give an idea of fluidity, with the peculiar change of the integuments which extraordinary

distension occasions, and after no long interval throwing up the livid tuberous prominences of the medullary fungus, we are warranted in concluding that the disease, as such, had its commencement in the interior or cancellated structure. Such was the case about to be related, which had at first and for many months only the character of spreading exostosis, resembling what has been called the spina ventosa, and apparently seated in the head or tuberosities of the os humeri.

Osteo-Medullary Tumour surrounding the Shoulder-joint.

A gentleman, æt. 35, of remarkably fine person, was resident in the East Indies when the first symptoms of this disease appeared. He could refer to no injury as an exciting cause, but considered that the disease had originated from exposure to a land wind, while sleeping in a newly built room. When I was first consulted upon the case three years ago, and indeed long afterwards, I considered it of simple origin and character. It was, as I thought, a bony enlargement of the great tuberosity of the humerus anteriorly, raising and fixing the pectoral muscles so as to obliterate the subclavicular fossa; and such was its situation and its size, that the proper motions of the joint were destroyed. The elevation of the tumour was not considerable, and a dull pain of the arm, the muscles of which were wasted and flabby, seemed to result from the pressure and stagnation of its vessels and nerves. The health was unimpaired, and the

disease considered to be what I should denominate periosteal exostosis. Impatient of the loss of motion and change of figure of the shoulder, this gentleman placed himself under the care of surgeons, who substituted for the quiet hitherto enjoined, active frictions, and extended artificial motion in all directions. From this time the disease acquired an alarmingly active character, both in its increase and the pain attending it. These frightful consequences, when too late to be arrested, no means were left untried to appease and mitigate. The baths of the continent and our coast were had recourse to, and counter-irritants of the most efficient kind perseveringly employed without effect. As the tumour crept round the joint, it became soft and equable, and at length semi-fluid like, and fluctuating to the touch.

Many months elapsed before the fungoid character was demonstrated. The intervening change was like that of a dropsical accumulation, so that some eminent surgeons who at that time saw the case, proposed plunging into it a trocar. The distress of its enormous magnitude and weight constituting a source of incessant irritation, and the difficulty of finding an endurable posture for even a short time, have greatly impaired the powers and spirits of the patient, who is still struggling with the disease. The deformity is now frightful, dark blueish-coloured fungoid elevations appear in three or four spots. The reticular texture of the skin, stretched almost to bursting, presents a curious appearance. The size of the tumour is as follows. A tape passed under the

axilla over the acromial extremity of the scapula on the sound side measures fourteen inches, on the diseased side, two feet ten inches. Under the axilla, over the apex of the tumour, three feet. Around its base below the insertion of the deltoid, eighteen inches.

1832. This gentleman died exhausted in April last. I sincerely regret to add, there was no post mortem examination. The only circumstance of the history requiring notice was a spontaneous discharge, upon two occasions, of encysted matter, to a considerable amount, which however scarcely occasioned a perceptible change in the volume, though it temporarily diminished the weight and tension of the tumour, and thus eased the pain.

The following case illustrates the innocent character of the ordinary exostosis of the same part, and perhaps also evinces the discretion of an opposite plan of treatment.

" Jeremiah Cox, æt. 50, fractured the joint of the shoulder thirty-four years ago; it is sixteen years since it began to tumify, accompanied by rheumatic pain: it has since been gradually enlarging, and the tumour is now enormous, in some parts osseous to the touch, in others gristly, covering the entire dorsum scapulæ, extending inferiorly as low as the insertion of the deltoid, and anteriorly covering the junction of the scapula and clavicle. Skin very thin and shining, yet no heat or appearance of inflamma-

tion; health good, tumour only restraining the motion of the arm. He has carefully abstained from all undue exertion and stimulating applications, though long since incapacitated from following his duties as a seaman."

Osteo-Medullary Tumour surrounding the Knee-joint.

I amputated the leg of a young gentleman, æt. 20, several years ago, for an elastic spheroidal tumour surrounding the knee-joint of some years' standing, attended by most excruciating pain. Surgeons of the first eminence had seen him successively and their opinions were divided as to its nature. One thought it the scrofulous white swelling, another a spina ventosa of the head of the tibia: the external characters however were distinctly those of the medullary fungus, when I was introduced, and upon consultation with Mr. Abernethy, decided upon the removal of the limb. It was of great size and the soft parts entirely changed and lost in the morbid structure, which was that mixture of deposit and disorganization so often, though so imperfectly, described; the extremities of the bones forming the joint were softened, and the head of the tibia was excavated and filled with the fungus which communicated freely by ulcerated openings of the shell with the surrounding diseased growth, but the synovial surface retained its integrity, though one side of the joint had a deep red tint, as if recent acute inflammation had existed. He died two

years afterwards of a return of the disease in the chest.

The disposition to a multiplication of bony tumours in distinct and remote parts of the same texture, of itself affords no proof of malignancy, for this has been commonly observed of exostosis, of ganglions of the bursæ mucosæ, of nævi, and even of adipose tumours. Thus the ossific diathesis may be so predominant as that several distinct exostoses, as I have often seen, may appear in the same subject without disparagement to the health. But if, in addition to rapid growth and the peculiar change of the soft parts, the patient's health sensibly declines; if, after the removal of a limb the seat of such a tumour, a similar tumour presents itself in the course of the absorbents, as for example in the lymphatic glands of the groin after amputation of the leg; and if, lastly, upon examination, either of the viscera should be found to contain a cancerous tubercle, the evidence is conclusive in proof of the malignant character of the original tumour.

Osseous Tumour of the Leg and Groin.

Two years ago I amputated the leg of a young man, who had an osseous growth from the outer side of the fibula extending one third of its entire length. The soft parts were changed and gave the impression of a malignant action in the tumour. The section shewed a smooth and homogeneous surface both of the cylinder and tumour, resembling ivory. There

was not a vestige of the cells or lamella of the bone. Before the stump had healed, my attention was directed to a cluster of lymphatic glands in the groin of the same side, which had become ossified and fixed since the removal of the limb. It did not increase considerably, and the young man went into the country when his stump was healed. I confess that I entertained serious apprehensions of the increase of the inguinal tumour beyond the reach of remedy. His health was declining rapidly.

Tumours which are adherent to the periosteum, bound down by strong fasciæ, have a great degree of firmness, and are sometimes supposed to be osteo-sarcomatous, when they are not so in fact. Of this an instance occurred lately at St. Thomas's, where a young man suffered amputation at the shoulder-joint for an oblong intermuscular tumour of the upper arm which was so connected, and of great firmness; but the section, though the greater portion was of the semi-organised udder-like species, clearly shewed the incipient medullary cancer.

In the spring of the present year this young man returned to the hospital with a tumour of similar character, but softer consistence, occupying the pectoral and axillary region of the same side. His health had undergone a fatal change; he had the rapid small pulse and the sunken cheek of a doomed man, and will most probably be no more when this paper is published. The amputation of an entire limb at

its articulation, for a not advanced or at least not strongly developed form of the disease, seemed to offer the most favourable chance of its elimination from the system.

I remember a man in St. Thomas's Hospital, who had a large bony fungus upon the leg, one on the right os innominatum very large, another on the opposite side of the pelvis within the abdomen, and several upon his ribs; the pleura being in many parts converted into bone.

Osteo-Medullary Tumour of the Ribs.

Elizabeth Davis, a child twenty-two months old, had a tumour of twelve months' growth, situated between the dorsal spine and left axilla. It had increased very much of late, tilting outward the inferior angle of the left scapula. It was evidently submuscular, as, though slightly moveable, the fingers could not be passed beneath it. Being taken for a deep seated abscess, it was punctured deeply three times successively; the cicatrix after each puncture seeming to point as if indicating matter—blood only issued. The mother removed the child, which soon afterwards died, and I was allowed to examine the body. The disease was a fungoid tumour of the consistence of cartilage, and of great size, both within and without the ribs, which were partially absorbed as well as the vertebræ adjoining. The circumstance worthy of note was, that the diseased masses, of a texture

perfectly similar, though closely adherent to the wall of the chest on its opposite sides, (as I have seen the medullary fungus on the opposite sides of the sclerotic,) no where communicated with each other. I considered the origin of these growths to be bony.

Where the bone is without diplöe, as in the face, the fungus takes its origin from the mucous membrane which lines it, and is not osseous, though spiculæ of the bone which has been absorbed, are intermingled with it.

The flat bones seem to be especially subject to the medullary cancer, judging from the several cases I have seen affecting the ossa innominata and cranium. Of the latter, one in particular I recall to recollection, in which a large soft tumour presented itself on the parietal bone of an old woman, and a section being made of the integument under the impression that it was an abscess, a free hæmorrhage followed, and the bone was found to be completely absorbed. Upon examination after death, which quickly followed, a hæmatoid tumour was discovered, occupying the space betwixt the dura mater, to which it firmly adhered, and the distended integument of the swelling. I have seen the same hæmatoid fungus upon the dura mater of the anterior lobe of the cerebrum, at the back of the orbit, accompanied by absorption of the posterior walls of the orbit. We see other examples in the medullary deposits which take place under the pericranium of the frontal bone, after the

medullary fungus of the eye, absorbing the bone. On the whole I conclude that the medullary cancer affects the cellular structure, connecting the fibrous membrane with the bone, and likewise that of the cancelli of bones possessing a diplöe. The state of the periosteum, as of the cancelli, depends in part on the original seat, and partly on the stage of the disease.

CONCLUDING OBSERVATIONS.

I recognize two species of malignant disease, the scirrhous and the medullary, the former not belonging to any particular constitution or temperament, the latter decidedly prevailing in, if not allied to, the strumous diathesis. Each species has its varieties characteristic of the texture affected, or of the peculiar habit of the individual.

Both consist essentially of foreign or adventitious matter, in whatever structure or under whatever form they appear.

Natural textures forming their bed become involved in the specific disease.

The scirrhous has a more limited range than the medullary; cellular texture is the common seat of both forms; that which enters into the composition of

glands, simple and compound, is especially the seat of scirrhus.

The medullary originates in cellular texture of all kinds, especially that which forms the connecting tissue, as the substratum of the several classes of membrane, cutaneous, serous, mucous, fibrous, and the connecting web of muscular fibres.

The primary form of scirrhus is unorganized tubercle, nucleated, and disposed to gradual softening of the centre.

The primary form of medullary cancer is cyst, containing either a cream or amber or chocolate coloured fluid, and investing a reticulated or spongy growth, sometimes peduncular, and sometimes of extended base, assuming various degrees of consistence and shades of colour, whence its numerous names founded on as many analogies.

The second or consecutive changes of both species disguise as they proceed, and at length obliterate the elementary character. Attempts have been made by some modern pathologists to unfold the elementary textures of these morbid growths, to refer their formation and development to cysts of different grades of evolution, and advancing from the simplest to the more complicated forms, to demonstrate an uniformity of arrangement and development sufficient

to warrant a classification of all the varieties of adventitious structure. The attempt appears to me to be more ingenious than convincing. Powerful lenses co-operating with a vivid imagination are apt to convey delusive appearances and analogies; and at all events such observations should be received with much caution after inflammatory changes have commenced, which are in their nature disorganizing and destructive, especially if undertaken to illustrate a preconceived hypothesis. Simplicity is not less the characteristic of original and natural structure, than the absence of it of that which is adventitious and preternatural; and the wildness and wantonness of disease, strictly so termed, are such as to render every individual of this formidable species a subject for separate analysis, in fact anormal. I have nevertheless long entertained an opinion that the ordinary mode of treating morbid specimens is such as to convey little information of any kind, and not seldom that which is erroneous. I mean the simple inspection of a recent section and its preservation in spirit,—an over fastidious caution to preserve inviolate rather than to unravel and take to pieces—and thus to sacrifice the opportunity of present and permanent instruction to the silly vanity of decorating the shelves of a cabinet. Multiplied sections, subjection to a graduated stream of water, maceration, compression, as well as the instant dissection of parts on removal, would yet throw much additional light upon morbid anatomy.

A reticular texture, loose or compact, sometimes

containing fluid, sometimes a solid deposit, may be stated to be the general basis of morbid formations; the arrangement presenting every variety as to definitiveness of form and size. Such I conceive to be the origin of cyst and sac, as well as their organized products; cellular texture, the connecting and all-pervading medium of animal structures, being the only cognizable substratum of organization in the reparation of injury or the manifestation of morbid growth.

The situation of the disease imparts a feature to it as peculiar, or even more so than the stage. As for example, a lymphatic gland, a muscle, a fibrous membrane, or the subcutaneous tissue; but still more strikingly a composite organ, as the stomach, liver, testicle, &c.

The characters of the scirrhous and medullary cancer, strongly marked and for the most part distinguishable as they are, present varieties of approximation and dissimilarity evidently incidental to situation. With respect to the varieties which prevail in the consistence and colour of tumours of the medullary species, I cannot assent to the opinion that these constitute any essential natural distinctions as to their family relation. The general features of diseases, as of landscapes, are similar, the details ever varying; no two individuals present more than the family likeness, although this is impressed with sufficient strength to admit of their immediate recognition. The local

influence is perhaps the greatest, but it is probable that the constitution also exerts a powerful one in promoting these varieties. The fungous growth of the dura mater and the membrane of the alimentary canal, it could scarcely be expected should exactly resemble each other, more than the fungus of the eye and the liver. The melanosis is by some supposed to constitute a distinct genus, although the tint of colour whence it derives this appellation, is the sole phenomenon distinguishing it from that which has been termed encephaloid *.

But the deposits formed in the lymphatic glands and muscular fibres, the tumours seated in the subcutaneous and intermuscular cellular membrane, in

* Mr. Fawdington's case, before referred to, is the truest specimen of the variety called melanoid, and which he, following the opinions of some eminent authorities, considers to form a distinct class of malignant tumour. I confess that, though unable to explain why this tumour should bear the black or reddish brown tint, and others the cream-white or amber-yellow, I can see no such difference between the malignant growths in the incidental features of size, consistence, form, and colour, as counterpoise their many and irresistible features of relationship in seat, organization, rapidity of increase, extent of origin, and mode of termination. The former are local varieties, the latter are constitutional standards. Of all there are doubtless encysted and unencysted or diffused forms, the latter I consider to be the secondary mode of deposition—I say deposition, because I can conceive of no excrementitious process by which the organized product of cysts, or that which is interstitial to the parenchyma of the viscera or of muscular fibre, and which takes its place as by a process of conversion, can be accounted for upon any known principle of the vital economy.

the eye, in the liver, &c., do severally resemble each other so strongly, that a practised observer quickly determines their nature from their analogy; and the scirrhi of the skin, the mammary glands, the pylorus, and uterus are just as strongly characterized and classed.

I have not seen blood vessel, nerve, or their sheaths, the synovial capsules of joints and articulating surfaces, or bursæ, affected by either species of cancer.

The fibrous membranes, as the periosteum and dura mater, I have several times seen giving origin to such tumours.

The skin and cellular membrane, mucous and serous membrane, muscular fibre, aponeurosis, and glands, both lymphatic and visceral, afford it a more or less frequent origin.

Does the disease invariably begin in deposition? In other words, is it always in the surgical sense truly a tumour in its origin—a new production? On this point I entertain no doubt. It is true we may sometimes first perceive it in the stage of ulceration, as in the face or lip, but this is an advanced stage, however superficial and small in extent may be the loss of substance; prior to this there has been an adhesive deposition, and the ulcerative process has been set up in pursuance and consequence of this change. So a pimple upon the soft skin of the glans penis, or pre-

puce, of the eyelid, or the lip, the patient invariably describes to have first excited his notice. Mucous and fibrous membranes are thickened and raised into tubercles and soft nodes. No structure is so remarkably converted as muscular fibre and gland into the medullary structure, their natural arrangement remaining for a considerable time.

The chimney sweeper's is the purest specimen of local cancer. Next to this the cancer of the lip; yet in both the constitution is predisposed, and unless it be, the occasional cause is ineffectual in producing the disease.

That the soot acts as an ingredient in the first formation of the disease, is shewn by the fact that handling soot will produce it, though the person has never followed the employment of a chimney sweeper.

Sir James Earle met with the disease in the hand and wrist of a gardener who was in the habit of carrying soot on the same arm to disperse it in manure, and thus produced a warty excrescence which afterwards ulcerated. It is further confirmed by the fact that the disease invariably returns if the party resumes, after its complete extirpation, the same trade; and in several instances of years' standing this has not happened, where the employment has been altogether abandoned.

In a virulent case of this disease in a country labourer, the sagacity of the surgeon, Mr. Earle, of St. Bartholomew's Hospital, enabled him summarily to pronounce its actual nature and origin. Upon enquiry it was ascertained that the patient had been five years before engaged in loading and unloading soot carts, and was after this employment attacked with a crop of warts in the groin which went on to ulcerate.

Yet that the disease requires for its formation a peculiar state of constitution, is proved by the fact that it never, or almost never, appears in the children and boys who form so large a proportion of the actual sweepers of chimneys. And that it is ultimately constitutional and thus destructive, no one can question who has watched its progress and termination.

Thus, in the cancer of the lip I have no doubt that the excoriation or hardening produced by the pipe is the general occasional cause; but of the number of smokers the proportion of persons so affected does not exceed that of cancerous to sound persons. The same observation would, I think, apply to the cases of cancer of the gum and of the tongue from diseased teeth.

Scirrhous cancer is in many cases grafted upon a morbid change of texture of long standing, whether tumour or ulcer, especially at a particular period of advanced life. I cannot positively attribute this cha-

racter to the medullary species, though in one or two instances I have been strongly inclined to that opinion.

I have not seen scirrhous and medullary cancer combined in the same organ, but I have repeatedly seen tumours in the same subject partaking of the characters of both species. For example, the scirrhous pylorus with medullary tumour of the ovaries. The cancer penis with medullary tumour of the groins and loins. The scirrhous mamma with the medullary tubercle of the viscera, both thoracic and abdominal. The cancer of the gums with medullary tumour of the pharynx and melanoid tumour of the common integument.

The modifications of texture I have no doubt explain an intermediate or mixed character constituting an occasional variety in such tumours, which serves the more to establish the individual species and the relation between them; and this combination would appear to extend in some rare instances even to the constitutional character. Thus the scirrhous tumour is sometimes multiplied indefinitely upon the skin, as related at page 373, or serous membrane, as mentioned at pages 353, 374, after the manner of the medullary, and the external medullary tumour is found upon examination after death to have been attended by an internal scirrhus, as of the liver or pylorus.

There is a class of tumours resembling scirrhus in

their character. They are for the most part unabsorbable depositions in the structure of visceral or lymphatic glands, the product of strumous inflammation, not susceptible or at least not disposed to suppurative action. To this belong certain tumours of the cervical, bronchial, lumbar, and mesenteric glands, ovaries, uterus, &c.

There is also a species of devastating and unhealable ulcer sometimes superficial, sometimes phagedenic, but making scarcely any impression on the health, and having no power to propagate itself by absorption and appear in other parts, which is the distinctive character of cancer, and stamps it a morbid poison formed in or absorbed into the blood. To this belong the several forms of the depascent lupus.

The subjects of these diseases resembling cancer of the scirrhous species, are for the most part scrofulous in their temperament, or labouring under a confirmed cachexia from the continual operation of depressing causes, as bad or insufficient food, or intemperate habits, or some internal organic change affecting the condition of the blood.

A still more striking resemblance exists between the changes of structure characterizing scrofula and medullary cancer; and it is certain that the latter disease often terminates by the intermingling or supervention of scrofulous inflammation, tubercle, or abscess, of which instances are given in the preceding pages. The following will illustrate my observation.

I attended and examined the body of a middle-aged gentleman, of a highly scrofulous temperament, who died of extensive abscess of the kidney. Within a few years of his death he had been the subject of suppurating glands of the neck, strumous opthalmitis, and a similar chronic inflammation of the coats of the testis. In addition to a nest of abscesses in the right kidney, was an incipient tumour upon the same side of the lumbar spine, adhering to it, and filling the head of the psoas muscle. The muscular fibres were converted into a brownish yellow substance, which was extensively deposited between and around those which retained their appearance, and gradually shaded to its termination in the belly of the muscle. The section strongly resembled the incipient medullary tumour.

Dec. 8th, 1831. Porter, a miller, æt. 25, of strumous habit, received a blow on the right testicle five months ago. Some weeks afterwards he found the part swelled, but not painful. He had never been affected with the venereal disease in any form. Finding the enlargement to continue, and feeling occasional sharp pains across the hypogastrium, he applied at the above date for relief. The part was of the size of a large hen's egg, very firm, equable, and elastic, like a bladder tensely inflated. He was freely cupped, leeched, and purged, and confined to a recumbent posture. On the 26th December, while taking the calomel and Dover's powder and leeching at intervals, he was attacked with œdematous erysi-

pelas of the scrotum and inguina accompanied with fever. The erysipelas wandered over the abdomen and thighs. After recovering from this complaint, no change was observed to have taken place in the testicle, which was ordered to be freely anointed with mercurial ointment, and a calomel and opium pill prescribed to be taken nightly.

Jan. 30th. He was attacked with ague, which was soon removed by the quinine bark.

Feb. 6th. He complained of excessive pain at the bottom of the belly, which was tender to the touch; and the pulse seeming to warrant it, sixteen ounces of blood were directed to be drawn from his arm, but he fainted before two ounces had flowed.

On the 2d of March he was seized with loss of speech and motion, and partial stupor. His mouth was a little drawn to the left side. Cupping glasses were applied to the neck, a blister to the scalp, and full action of the bowels obtained.

12th. His speech, sense, and motive power partially recovered. His appearance was much emaciated; pulse quick and feeble, the condition of the testicle stationary. A hardened and irregular knotted cord was now plainly felt extending along the right brim of the pelvis, taking the course of the spermatic vessels and apparently moved by drawing down the diseased testicle. The cord was very little en-

larged, but partook of the induration of the testis. The poor man lingered till the 15th of April, the abdomen being very tense and painful, the testis unaltered. The mercurial ointment was very freely rubbed into the abdomen; but the system was never affected by it.

Examination.—The testicle had lost its natural subdivisions, having an uniform smooth surface, and the close coat distended by a white lardaceous matter softer and more broken in the centre than at the circumference; the fibrous septa standing inwards from the thickened tunic was all that remained of original structure. On the surface of the liver were several encysted abscesses, some as big as walnuts and some smaller.

The substance of this viscus on section presented similar abscesses. The contents of some were a deposit of cheesy matter, and of others pus, all being invested by distinct cysts. The spleen was studded with tubercles, also containing caseous matter, or the matter of scrofulous suppuration. From the lower part of the right kidney to the abdominal ring extended a solid encysted tumour, containing upon incision the same lardaceous matter as that filling the testicle, and a bright, yellow coloured, fluid in other parts, differing in colour but not in consistence from pus. The mesenteric glands were partially enlarged. The urinary organs were healthy. There was no organic change in the brain.

This case was altogether peculiar. No part of the treatment seemed to reach or even to affect the progress of it. From the severe abdominal pains complained of from the time of his admission, it may be inferred that the disease had already taken possession of that cavity. He was a dram-drinker, the bowels were altogether torpid or the opposite; and the mercury, never absorbed, seemed invariably and in all forms to irritate the system. The hard tumour lying on the brim of the pelvis was supposed by several observers during life to be scirrhous, and to demonstrate that the induration of the testicle was of the same description; while the lardaceous section of the testicle, and of the tumours of the liver and spleen, and the adventitious growth below the kidney, together with the amber colour of its fluid, conveyed to the minds of some present at the dissection the impression, that the disease was the medullary cancer. However ambiguous these circumstances, and fairly suggesting such ideas, the truth is clear that the disease was altogether scrofulous, and I adduce it for the purpose of shewing a resemblance which, if I am not greatly mistaken, has led to erroneous inferences both during life and after death, viz. the first period of observation allowing it to be regarded as scirrhus, the second, medullary.

Upon the whole I feel confirmed in the opinion advanced in my former memoir on this subject, that the medullary disease is the cancer of scrofulous habits. The great pathological distinction between

scirrhous and medullary cancer consists in this : the first is generally topical, and without any evidence of previous disease gradually impregnates the system with the poison which it engenders ; the second is in its origin a disease of the system, and its local manifestation, secondary. So that in the former there is a possibility by early operation of triumphing over the disease ; in the second we may gain a respite, but at the best of very short duration.

When indeed the health is materially impaired prior to the appearance of scirrhus, there is much reason to fear that the predisposition is invincible, for not only does the disease run a very rapid course, but the earliest removal of the part is almost invariably followed by a return of it.

The metastasis, as it would seem, from the surface to the viscera, is the most painful event which we are called upon to witness. I mean the case in which after operation, even the earliest, after absorption of the scirrhus, after the healing up in a great measure of the cancerous ulcer, the patient is attacked with spasmodic cough and alarming dyspnœa, or violent spasmodic pains shooting through the epigastrium, which soon become diffused and affect successively all parts of the trunk, especially the muscles of the spine and loins, and so paralyzing them that she is unable to maintain herself erect, or by her own efforts to turn in bed. Hectic irritation is constant, with profuse night perspirations ; the complexion is sallow, and

sometimes jaundiced; the flesh flabby and wasted. The secretions of the liver and kidney denote the imperfect function and then impaired structure of these organs, and at length the stomach rejects food. This case has been before me unhappily so often, as to qualify my anxiety for operation at any period.

Yet if the cases are rare in our experience in which the disease does not in some shape return, I believe those would be more rare in which it did, if the operation were performed immediately upon its discovery. On the ground of failure from delay, it would be as reasonable to condemn the operation for the strangulated hernia. Let there be no time lost in the removal of the tumour, or the stricture, and in both cases the operation will be oftener vindicated by its success.

But how can the diathesis be altered when the local mischief appears, or even when it is extirpated? This is the problem, and until we arrive at its solution, the disease will continue to baffle our best efforts. In both cases it is of equal moment; for though in one instance the mass of blood is in a morbid state before its product is deposited, and in the other the tubercle, while it remains sound, is inert in the generation of the poison, yet the constitution is predisposed to adopt the disease wherever the tubercle is formed, and once tainted, the cases become parallel.

The prevailing condition of the blood in the mor-

bid poison of cancer is yet to be ascertained; indirect evidence of its vitiated state is furnished by the symptomatic changes observed in the subjects of the disease, and of which the strongest perhaps consists in the altered properties, if not texture, of bone. But yesterday I was called to visit a lady whose breast I removed, on the appearance of a scirrhous tubercle, four years since; in whose case the return of the disease in the axilla confirms the cancerous diathesis. Though by no means an aged person, her thigh bone had been audibly snapped in two by an action of the muscles, purely involuntary, whilst sitting upon the sofa.

The views recently opened up by Dr. Stevens of the acute morbid poisons constituting the malignant fevers of Africa and the West Indies, and the disease now prevailing in this country under the title of spasmodic cholera, appear to me to demand the particular consideration of pathologists in reference to the chronic morbid poisons. In saying this, I profess no opinion of the merits of any mode of treatment adopted in pursuance of information obtained from the analysis of the blood, having no opportunity of forming one; but I regard the discovery of certain material changes in the composition and properties of the blood in these diseases, rendering it in the compass of a few hours not only incapable of supporting life, but a poison to the system in which it circulates, as a phenomenon equally novel and important. It appears to me that it is through this medium

alone that we can hope to reach the disease in its elementary form, or pursue any rational plan for its destruction.

I am conscious that the preceding sketch of the several forms of malignant disease, as it appears in the different textures and organs of the body, is meagre in comparison with what a compiler of moderate industry might supply, and the style of my observations will probably be regarded as desultory, since I have allowed myself to speak in more detail than perhaps was necessary of diseases with which these are liable to be, and actually are, confounded. My object however is answered if I have succeeded, so far as verbal description permits, in representing with accuracy sufficient for recognition, the various appearances which this cruel scourge of humanity exhibits in its various sites; and in demonstrating a more comprehensive and practical classification than is indicated by the researches of some modern pathologists, who not being engaged in the practice of surgery, are perhaps less conversant with the character and relations of these diseases in the living subject.

ON THE

PHENOMENA AND APPEARANCES

FROM

PARTIAL OBSTRUCTION

IN

THE CEREBRAL CIRCULATION.

BY JOHN HOWSHIP, ESQ.

SURGEON TO ST. GEORGE'S INFIRMARY, AND TEACHER OF SURGERY.

READ 8TH MAY, 1832.

The great importance of the functions of the brain, and more especially the obscurity that overshadows the mode in which that organ fulfils its highest purposes in the economy, are such as must still give interest to every remark tending to throw any additional light upon its pathological anatomy.

The notes from which this present paper is taken regard two cases that fell under my notice. In the first are seen the symptoms during life, and appearances after death, peculiar to inflammation of the

large veins upon the pia mater; in the second may be observed the inconvenience occasioned by the pressure of a large tumour, so situated as to prevent the free return of venous blood from the affected side of the head; and in both are shewn the consequences induced by a partial obstruction to the flow of blood through the brain. In the one I shall demonstrate a particular appearance in the medullary substance of the brain, which although more than once previously met with, I had not before been able satisfactorily to explain; and in the other, we shall have occasion to remark (and that to a very curious extent) the extraordinary powers a large artery may sometimes acquire and exert in a very infirm constitution, when labouring to drive forward the blood through the round of an impeded circulation.

CASE I.

Friday, May 30, 1828.—At the request of the physician, I examined the body of J. E. who had died in one of the medical wards of St. George's Infirmary. It appeared that she was a young woman of dissolute habits. On the 17th instant she had miscarried, although she concealed the circumstance at the time. On the 21st she was brought into the house in a chair. For the following day and night extremely weak and languid; she complained of no pain in the head or elsewhere, but sometimes conversed with those around her. She had some thirst, with quick

pulse. There was, nevertheless, a degree of stupor about her, and this gradually increased, as well as a difficulty in articulation; so that, for several days before she died, she was unable to say a word, although repeatedly attempting to speak.

During her illness she observed to the nurse that she wanted some brandy or gin, saying, that was what she had been most used to. She frequently moaned aloud, and from the first had slight tremors, and occasional subsultus. The right side, for several days previous to her death, was completely paralytic; during which period involuntary stools passed, the effect of the medicines directed.

On the 24th considerably worse than before; her powers of utterance slow and imperfect, with little disposition to notice those about her.

On the 25th she only spoke twice, but had still some power of motion in the right leg. The 26th, silent and comatose; but on one occasion drank a little barley-water that was offered her. There were now frequent manifestations of subsultus, with catchings and distortion in the muscles of the face. She expired on the morning of Thursday, May 29.

In examining the body, the head was first inspected. Turning aside the dura mater, an appearance of thickening and opacity was seen, from inflamma-

tion of one of the large veins, traversing the middle of the right hemisphere, to its termination in the longitudinal sinus; and every part of the pia mater from which blood was collected by the branches of this vein, was observed to be red from inflammation, and had specks of blood effused into its fine cellular texture.

On making a section of the brain, I found the cortical and medullary substance of a healthy consistence and colour, yet exhibiting a peculiar appearance, as if every capillary vessel presenting itself within a given space, was enlarged to three or four times its natural diameter. These equally enlarged capillary arteries were as equally dispersed over a given extent of surface, beyond which, as the appearance terminated abruptly, the medullary substance became at once clear and white.

I next laid aside the dura mater from the left side of the cerebrum, where from inflammation of two or three of the large veins having taken place, the changes already described had gone on to induce small effusions of blood, in minute masses, between the pia mater and brain; and on cutting into the cerebral substance at this part, I found that here and there, the congested capillaries had apparently ruptured, depositing within the medullary substance small coagula, a few grains each in weight. These little masses of blood, effused into the left hemisphere

of the brain, sufficiently explained the more positive state of paralysis which had existed on the right side of the body.

In the thorax and abdomen, the appearances were natural.

OBSERVATIONS.

The above appearances may be regarded, I conceive, as demonstrative of the effects induced by congestion, affecting a part of the brain, from inflammation and obstruction in the trunk of the corresponding vein. The more extensively diffused effects of general congestion upon the surface, or within the substance of the brain, proceeding from various causes, have been frequently enough observed; but the more partial consequences incident to obstruction of one or two only of the superficial veins, have been less correctly noticed.

I have presented two portions of the left hemisphere of the cerebrum, which exhibit these appearances very distinctly.

CASE II.

June 1831. Mrs. J., aged 80 years, a lady of spare and bilious habit, first consulted me in December 1818, for a tumour in the neck, which she said was

frequently uneasy, and at times pulsated with distressing violence. It followed the motions of the larynx, and appeared to be an enlargement of the right lobe of the thyroid gland. This swelling had commenced at the age of twenty-five, being, when first perceived, no larger than a hazel nut; attached apparently to the right side of the throat.

For many years she thought nothing of it, although the tumour slowly increased. I directed her to try the spong. ust.; but this remedy so disturbed the pulse and nervous system, that it was laid aside before any advantage could be derived from its administration.

June 2d, 1825. I was requested to see Mrs. J. for complaints of extreme languor and sinking, which she said, she was quite sure she could not survive, and was fretful when I expressed a contrary opinion. The tumour, at that time as large as a small melon, occupied the right side of the neck, was of a soft elastic consistence, and pretty equal upon its surface. It now lay behind the sterno-mastoid muscle, the fibres of which were somewhat spread upon its surface. The right carotid artery, pushed outwards by the tumour, might be traced passing upwards upon its external and posterior part. That vessel, and indeed all the arteries upon the right side of the neck, pulsated at times with considerable activity.

She was frequently disturbed in the night, by ex-

hausting paroxysms of a violent convulsive cough; the effect, no doubt, of irritation or pressure from the tumour, which had for some years obliged her to sleep sitting up in bed, supported with pillows. The pulse was natural, and general health tolerably good.

May 28th, 1828. This lady's niece called to acquaint me that her aunt's complaints were worse. She now felt some difficulty in swallowing, solids especially; the effort inducing an appearance as if, for some minutes, she was choking; she had however no material difficulty in breathing. In the night she said, she sometimes did not know whether her aunt breathed or not; and she had observed her in that way for half an hour together, while she was sound asleep. She generally seemed to recover by drawing rather a deep breath, and waking up a little; but she never, on these occasions, complained of any thing, nor was at all sensible of what had happened. This state of breathing in her sleep had been occasionally observed for the last six months.

September 20th, 1830. I made a drawing of the tumour, which the patient observed had been for the last twenty years uneasy and painful, sometimes acutely so; aching and occasionally shooting, and of late, she said, a large vessel (the right carotid artery) had acquired the habit of beating and throbbing with violent force and activity. This, I found on examination, was the fact, for that artery was pulsating with most extraordinary energy and power. The

action of the left carotid, on the other hand, was so gentle and quiet as to be scarcely perceptible, but the common trunk of the right carotid, coursing round the tumour, raised up the integuments in a bold elevated ridge.

The coats of the enlarged artery, when pressed, appeared to be three or four times their natural thickness, and the size of the vessel increased to the diameter of three-eighths of an inch.

The trachea and larynx were pressed over to the left side by the increasing volume of the tumour, which was still so closely attached as to be distinctly raised and depressed in the act of deglutition.

Monday, April 18th, 1831. Last Friday, while taking tea, she complained of being extremely giddy. This continued all the evening, and on the following morning at breakfast, she said she was less giddy, but had an unpleasant feeling in her head, so as scarcely to know what she was doing. Cutting her toast, as usual, in small bits to eat, she threw them on the carpet, and was just going to throw the tea after them, when her niece caught her hand, and prevented it. She said nothing at the time but soon recollected herself, and then observed, "I am a poor lost soul, and have quite lost my memory."

In the afternoon she seemed more cheerful, but the following night awoke in great agitation and distress,

said she was dying, and it was found that the powers of sensation and motion in the left side and extremities were lost. In a few hours these complaints partially subsided.

The following morning I was requested to see her; and by the assistance of leeches to the temples, and an active cathartic, she was, in a day or two, enabled to move again, from one apartment to another, with only one arm to lean on; while before, she had required the assistance of two. She could also use her hands better, but her head still remained, she said, as bad as ever.

July 19th. This lady died very early in the morning; and the same evening I examined the body.

In the head, between the arachnoid membrane and pia mater, there was a considerable serous effusion, most conspicuous over the right hemisphere. On gently separating the hemispheres, the corpus callosum was apparently tense; and about ℥iiss. of serum were found in the ventricles; the septum lucidum being expanded and thin. The substance of the corpus callosum towards its right margin, was somewhat softer than natural; the medullary matter cut into, being found to contain several cavities or small spaces within its substance, filled with serous fluid.

I removed the tumour from the neck; and on subsequent examination found the internal jugular vein,

in company with the artery, passing round the tumour; it was now also ascertained by measurement, that although the right carotid artery was very much larger and thicker, it was not materially longer than the left; a circumstance explained by the unusual length of the arteria innominata, in this instance.

It was pretty evident that the tumour itself contained some fluid; but desirous to preserve its figure entire, I preferred immersing it in rectified spirit, without making any division of its substance, in which state it is, therefore, now put up.

In the abdomen, I was somewhat surprised to find the caput coli present itself among the small intestines upon the left side; so completely detached from its usual situation in the right side, as to be only very loosely connected by a membranous expansion to the lumbar vertebræ.

The left kidney, which had a few small vesicular appearances upon its surface, was removed. I afterwards filled it with fine injection, and in so doing, found the vermilion as well as the size return by the vein nearly as freely as it flowed in by the artery. The kidney subsequently laid open, demonstrates numerous particles of dark coloured calculous matter, deposited in the secreting structure, apparently in the tubuli uriniferi of the gland.

OBSERVATIONS.

The protracted continuance of the disease in the above case presents only that character with which we are sufficiently familiar. It is not, however, common to see the trunk of the carotid artery so displaced, as to be found directly beneath the integuments of the neck, and apparently extended so as to occupy nearly half the circumference of a large tumour. But the most unusual circumstances, perhaps, are the very peculiar increase in the size and strength of that vessel, and most especially the extreme force with which it laboured to overcome the difficulties with which it had to struggle. In these last particulars, this case affords a very rare example in illustration of a principle laid down by the late Mr. Hunter, which disposes all muscular parts to acquire increased strength and power, equivalent to any incidental difficulty or embarrassment that may arise in the performance of their functions, from the inroads of disease.

21, Saville Row,
April 26th, 1832.

OF

A PECULIARITY

IN THE

CONFORMATION

OF

THE SKELETON IN RICKETS.

BY ALEXANDER SHAW, ESQ.

COMMUNICATED BY SIR CHARLES BELL, K.H., F.R.S.

READ MAY 22ND, 1832.

It is my object to direct the attention of the Society to a peculiarity in the form of the skeleton, when distorted by rickets, which I have not found noticed in the works that treat of this disease.

The appearance to which I allude is distinct from the incurvation of the bones, and is to be seen, only by examining the relative proportions which the different parts of the skeleton bear to one another. As this examination demonstrates that rickets, besides producing softening and distortion of the bones, has the effect of interrupting their growth:—as it leads to the observation of a remarkable character in the pelvis, which has an important relation to the practice of midwifery, but which has hitherto been overlooked

by pathologists;—and as it tends to make the diagnosis respecting the form of the pelvis, in the various kinds of distortion, simple and complete, I have thought that the subject deserved the consideration of the members of the Society.

Of the Distortion which is produced by Rickets.

If we consult the various works which treat of distortion, we shall find that considerable confusion exists as to the nature of the deformity which is caused by rickets. It is necessary, therefore, to define what is the exact kind of distortion which is meant, when we speak of a skeleton being affected by this disease.

It is conceived by a numerous class of writers, that rickets is a disease which may commence at all periods of life, and that it is the common source of the varieties of deformity included under the term lateral distortion of the spine. Hence it has been concluded that the spinal curvature, which begins at the age of twelve or fourteen, and which is distinguished for its remarkable frequency in females, is the effect of this disorder of the osseous system.

Several objections might be urged against this theory:—but it may be sufficient to observe; first, that the authors who support it, have made a remarkable, and, at the same time, a fatal omission,—they have dwelt at much length upon the appearances

of the distortion, (as if these alone could establish an identity with the disease,) and have neglected to prove that the concomitant symptoms, denoting the derangement of the system, had a correspondence with those which occur in rickets. It is known that this disease is a formidable and, too frequently, a fatal disorder during childhood; and produces a train of the most distressing and strongly marked symptoms:—yet it would appear, that when rickets occurs about the age of puberty, it is unattended with constitutional disturbance of any kind. But, if the disease really does prevail, is it not fair to surmise, that as the bones at a later age, are both larger and more solid than during infancy, the softening of their textures should be accompanied with an aggravation of all the symptoms? 2nd. It is another example of the carelessness with which this subject has been treated, that although rickets is acknowledged to be a specific disorder, which embraces all the bones of the skeleton, the authors who have maintained this theory (among whom we have to include the names of Petit, Portal, Pouteau, Montfaulcon, and others of equal celebrity,) have confined their observations to its effects upon the vertebral column and the thorax. For example, in the treatise of Portal, entitled, "Sur le Rachitisme," we do not find more than a simple passing remark, introduced incidentally, upon the condition of the pelvis in this disease. Indeed, the only author, of those who espouse this view, that has warned us of the dangers to which the pelvis must necessarily be exposed, as

well as the bones of the spine and chest, in these cases was Mr. Wilson, and such was his impression of the degree of softness to which the bones were reduced by the abstraction of the phosphate of lime from their textures, that he conceived that the simple application of instruments for supporting the spine, might be productive of the worst kind of deformity of the pelvis. This change in the figure of these solid bones he believed might be effected, "even after the pelvis was fully and well formed,"—and speaking of the frequency of lateral curvature in females, and urging with earnestness that these artificial supports should be removed, he adds, "by this timely attention, the lives of many mothers and children may be saved, in cases where either mother or child, or perhaps both, must otherwise have perished."*

My brother, the late Mr. John Shaw, being desirous of determining whether a disease of the osseous system, attended with so much danger to the pelvis, was to be considered the cause of that kind of deformity to which females were most especially subject, directed his attention to this question in his work upon Distortions of the Spine. With the view of illustrating this point, he examined an extensive series of morbid specimens of the spine, and from contemplating these, he was enabled to demonstrate this fact;—that the spinal column may be incurvated in a lateral direction, and may present a distortion

* Lectures on the Bones, delivered before the Royal College of Surgeons, p. 175. 1820.

of the same appearance, in two conditions of the system, which are altogether distinct from each other. In one class of these specimens he observed that there was lateral curvature of the spine, combined with distortion of the ribs—but this constituted the whole extent of the deformity,—in none of the other bones of the skeleton, however weak or exposed to pressure they might be, was there any trace of distortion to be discovered. In the other series of preparations, on the contrary, not only was there lateral distortion of the spine and ribs, such as was presented in the former specimens, but combined with this there was an universal deformity of the whole skeleton, including the cylindrical and solid, as well as the most delicate and pliant bones. It accordingly appeared that in the first of these series of preparations it was only a limited portion of the skeleton that was affected; while in the latter, every individual bone was deformed; and it was inferred that a cause which was peculiar to the vertebral column and to the ribs, or of a local nature, gave rise to the former kind; while a general specific disease occasioned the other.

Hence it was shewn on the authority of morbid anatomy, that the mere distortion of the spinal column could not be considered sufficient to indicate a general affection of the osseous system, such as rickets. It was proved, on the contrary, that this part might become deformed, even to the most remarkable extent, without any of the more solid bones

losing their natural shapes. Mr. Wilson, in describing the liability of the pelvis to be deformed, pointed to the vertebral column alone as affording indications of the existence of rickets, and neglected to speak of the condition of the bones of the extremities;—Mr. Shaw, on the other hand, was led to conclude that "in whatever state of distortion the spine and ribs may be, the bones of the pelvis will not be found distorted unless there be at the same time marks of rickets in some of the long and solid bones." As it is familiar to every person that neither the bones of the upper, nor those of the lower, extremities, become incurvated when the distortion commences near the age of puberty, it follows that a cause, totally different from rickets, gives rise to it, and that the pelvis incurs no danger of being implicated in this kind of deformity.

Subsequent to the publication of the work on distortion by Mr. Shaw, several writers of eminence have given their support to the former theory respecting rickets. But they have neglected to controvert, or even to state the arguments which are opposed to this view; hence we need only consider their opinions on this subject very briefly. The first among these authors is Richerand, who in his work entitled "Sur le Progrès recens de la Chirurgie," has, it may be said, brought us back to the very notions which flourished in the time of Glisson, the first writer upon this disease. He has, however,

ventured further than most of those who have preceded him; for he has made these two remarkable statements respecting rickets,—first, that it prevails with greater frequency about the age of puberty, than at any other period of life; and secondly, that it depends for its origin upon the establishment of the catamenial discharge in young females, and, hence, is exclusively found in that sex. Notwithstanding this alleged prevalence of the complaint in women, he neglects, however, to refer once to the condition of the pelvis *. Capuron, an authority upon the subject of midwifery, while speaking of distortion, also supports the opinion that rickets attacks the osseous system at all periods of life. Pravaz, although he owns that this disease is more commonly met with in childhood, explains the origin of the lateral curvature which is so frequent in girls, on the supposition that it is produced by rickets. Marjolin classifies distortion of the spine and of the pelvis, as occurring with equal frequency, and, as it would appear, proceeding from the same disease in every case. Velpeau, while discussing the uses of the pelvi-

* The only observation which this author makes respecting the pelvis would imply that it was at first deformed, but afterwards was restored to its natural shape by the treatment which he recommends, "la colonne vertebrale participe à cet effet general: les os, dont le tissu se dilate, s'epanouit et s'incruste en même temps de phosphate de chaux, element de leur solidité, deviennent capable de supporter le poids du corps. Les os qui forment l'enciente du bassin et de la poitrine, se redressent à mesure que s'effacent les inclinaisons vicieuses de la colonne."

meter, in cases where difficulty of labour is apprehended from deformity of the pelvis, concludes that a disease to which he gives the name osteo-malaxie, but which he does not define or distinguish from rickets, although it may be said to produce the very same changes in the bones, is the source of the spinal distortion so common in young girls *.

As the objection, however, applies generally to these authors, that they neglect altogether to meet the arguments which are opposed to their views and rely solely upon their unsupported assertions, we may be allowed to adhere to the definition of rickets, as it was laid down by Mr. John Shaw. Accordingly it is proposed, in the following observations, to consider those skeletons only as true specimens of the effects of this disease, in which the distortion is exhibited throughout all the osseous system together: —in the skull, the cylindrical bones of the extremities, and the large bones of the pelvis, as well as in the spinal column and the thorax.

* The following extract may show the confusion which prevails upon this subject, in some of the treatises upon midwifery. "En disant qu'il suffit qu'une jeune personne ait été nouée ou *rachitique*, qu'elle ait une deviation de la colonne vertebrale, pour lui defendre le mariage, cet auteur (Puzos) d'ailleurs si sage, est assurement allé trop loin: et l'humanité d'accord avec le justice, devaient appeler de son jugement. Combiens de femmes contrefaites mettent au monde avec la plus grande facilité, des enfans volumineux et robustes."—Velpeau, Traité Elem. de l'art des Accouch.—1. 53.

Of the relative Proportions in the Ricketty Skeleton compared with those in the natural Adult Skeleton.

In examining a skeleton deformed by rickets, our attention is apt to be exclusively directed to the distortion of its several bones. But if we abstract from our minds, or make allowance for these incurvations or irregularities, and look only to the relative dimensions of the skeleton, we shall perceive that it has a configuration different from what belongs to the natural skeleton. The human figure, at maturity, is characterized by the lower extremities having a remarkable length, as well as breadth and solidity; while the superior parts are comparatively small and light in their structure. The figure of the ricketty skeleton, on the other hand, is distinguished by the head, the thorax, and the arms being preponderating and large, while the pelvis and lower extremities are in a relative degree, diminutive and short. This peculiarity I found more strongly marked in some deformed skeletons than in others, but in order to illustrate that it is a general character belonging to rickets, I took the measurements of eight specimens, and compared the average numbers resulting from these, with the corresponding measurements of the natural skeleton. As these deformed skeletons, together with six additional specimens of distorted pelvis, were obtained from female

subjects, they were contrasted with the standard proportions peculiar to the female sex.

By examining the Table (No. 1.) at the end of the paper, it will be observed, in the first place, that all the bones of the skeleton deformed by rickets, are deficient to a certain degree in their size. But if we direct our attention to the upper and to the lower divisions of the frame, it will be discovered that this diminution is much more considerable in the latter than in the former—that is, in the pelvis and the bones of the leg, than in the skull, the spine, the thorax, or the bones of the upper extremity. For example, in the deformed skeletons, the average length of the spinal column, when measured along its curvatures, was twenty-two and five-eights inches, while in the natural skeleton it was twenty-three and a half; making a difference only of seven-eights of an inch: again, the length of the arms was twenty-four inches and a half, while in the natural skeleton it was twenty-seven inches, making a difference of two inches and a half. But in examining the lower division, the average length of the legs, measured from the larger trochanter to the heel was twenty-four inches and a half in the deformed skeletons, while in the natural skeleton, it was thirty-five inches; or the difference amounted to ten inches and a half. By combining these measurements of the spine and of the bones of the arm, and contrasting them with those of the leg, it will be found that the former parts scarcely lose one-fifteenth of their natural

length, while the latter lose somewhat more than a third. If we examine, in the next place, the dimensions of the head, and compare them with those of the pelvis, the same contrast will be observed. The diminution of the skull is scarcely to be perceived; while that of the pelvis is most remarkable in its extent. Thus, the average length of the os innominatum, measured from the spine of the ilium to the ischium, was, in the fourteen ricketty pelves, six inches and five-sevenths, while in the natural pelvis, it was eight inches and a half:—the space across the ilium, from the anterior to the posterior spinous process, was five inches and three-eights, while in the natural one it was seven inches and a quarter:—the greatest breadth from one spine of the ilium to the other, was nine inches and five-sevenths, while in the natural pelvis it was eleven and a quarter;—lastly, the space from the pubes to the sacrum was two inches and four-sevenths, while in the natural pelvis it was four and a half. By adding these measurements together, it will be found that in the ricketty pelves, the average number of the whole is six and a small fraction, while in the natural female pelvis it is almost eight; or, in other words, the general deficiency of the deformed bones amounts to very nearly a quarter of their natural size.

Since my attention has been directed to this subject, I have not failed to observe with interest the forms of those individuals, distorted from rickets, whom we have numerous opportunities of meeting in the

streets. It is generally remarked that these persons are diminutive in height; but it is not so commonly noticed how much this shortness of stature results from the smallness of the lower extremities—which is independent altogether of the incurvations of the bones. If we refer to Table 1, and look along the lines which contain the measurements of the bones of the leg and those of the arm, it will be seen that there are only two examples, in which the length of the leg exceeds that of the arm even to a trifling degree, yet in the natural figure, the leg measured from the hip-joint to the heel, is seven inches longer than the arm.

Of the Changes which the Human Figure undergoes in its development: in illustration of the Peculiarity in the Proportions of the Ricketty Skeleton.

If we proceed, in the next place, to consider what may be the cause of this particular form in rickets, we must direct our attention first to the course of the development of the bones. Hitherto, we have compared the proportions of the ricketty skeleton with those which are peculiar to the full grown adult; but it will be seen that in order to discover a correspondence with the natural figure, we must contrast them with the skeleton previous to its arriving at maturity. During the process of growth, the human figure undergoes a remarkable change in its proportions; and that we may fully comprehend the

extent of this revolution, it is necessary that we attend to the two grand objects for which it is accomplished:—viz., First, the configuration of the fœtus, while it remains inclosed within the womb, must bear a relation to the act of parturition.—Secondly, the form of the adult must be accommodated to his maintaining the erect position of his body. It will be seen, that the conformation which is admirably adapted for the first of these objects is altogether inconsistent with the latter.

If we examine a human embryo at the earliest period, we shall perceive that, even then, there are provisions in its form for its future safe delivery. In natural labour, the head descends first, and it is to obtain the position of the head next the orifice of the womb, that the peculiar figure of the fœtus, as contrasted with that of the adult, is impressed upon it thus early. The head at the commencement of the growth, has such a remarkable development that it forms one third or even more, of the entire bulk of the body. The umbilical cord, by which the embryo is suspended from the fundus of the uterus, is short and thick, and it is attached to the extremity of the trunk directly opposite to the head: hence, it follows, that as the whole germ floats in the liquor amnii, the head will gravitate towards the cervix, and be directed over the opening, through which it is destined to pass in the act of delivery.

In observing the form of the fœtus, it is interesting

to notice how slowly both the extremities become developed. These continue to be remarkably small, and resembling short appendages, rather than perfect limbs, for a considerable time. Now, it would appear, that the design was to delay the growth of these parts until the head of the fœtus had become safely lodged over the canal which leads to the os uteri. If the limbs had possessed, at the first, the same relative length which belongs to them at adolescence, it is obvious that while suspended in the liquor amnii, they would have hung down towards the cervix, and in all probability have become impacted between the head and the orifice of the womb. This is an accident which occasionally happens, notwithstanding the provisions for guarding against it; and the accoucheur knows how serious are the dangers, which attend a presentation either of the hand or of the foot in delivery*.

But the circumstance which principally distinguishes

* It is a favourite theory that the configuration of the fœtus, at the different epochs of its growth, represents by "analogy," the gradations in the animal kingdom, and in illustrating this principle the progressive development of the extremities is much referred to. For example, when the embryo is without extremities, the human being is said to resemble a molluscous animal; when the upper extremities alone are developed, he is likened to the cetacei or by some to the whale; when the inferior extremities present themselves, but are yet smaller than the superior, a resemblance is discovered to the walrus, &c. But it has not been considered, how important these modifications of the shape are to the peculiar gestation and act of parturition in the human subject.

the form of the fœtus from that of the adult, is the extraordinary smallness of the pelvis and of the legs, when compared with the size of the head, and of the trunk. Portal has conjectured that this was a provision for assisting the delivery of the child when the breech presented in labour;—that the pelvis dilated the os uteri like a wedge, thus permitting the head to pass with facility*. Haller, Bichat, and other physiologists have conceived, that this conformation was only an effect of the peculiar circulation of the blood in the fœtus. The umbilical arteries, they alleged, conveyed away the stream of blood from the pelvis and lower extremities to the placenta, and thus, by an imperfection or a mere accident, as we must presume, these parts remained diminutive while the rest of the body increased in size. But such an explanation cannot be admitted, 1st. Because the current of blood, thus supposed to be diverted from its course, is not intended for nourishing the limbs, which is evinced by its passing to the placenta, the function of which part is essential to the life of the fœtus. 2nd. It is a law of the economy, exhibited in numerous organs of the body, that the distribution of the blood, has a reference to the necessities which demand its supply, and is not influenced by the mere mechanical arrangement of the vessels;—thus when the uterus, the mammæ, and other organs become evolved or active in their functions, the blood-vessels enlarge in a corresponding measure; and when these parts subside, the arteries become

* Anat. Med. Tom. I. p. 18.

diminished at the same time. In varicose aneurism of the arm, where the blood is truly diverted from its course, being conveyed back to the heart by the communication formed between the main artery and the vein, the arm does not shrink or lose its nourishment; but the humeral artery becomes increased in size, and transmits a larger supply of blood. 3rd. It is not to be granted that because the lower extremities are found diminutive in size, the circulation of blood in them is therefore more languid; or, it may be asked, how we shall account for the points of ossification in the bones of the foot exhibiting a more rapid growth at the period of birth than those in the corresponding bones of the hand. If we examine these small bones in a quadruped newly dropped, such as in the young colt, where the circulation of the blood is the same as in the human subject, but where there is a provision for a more early use of the legs, we shall not find the same contrast between the anterior and posterior extremities. Neither shall we find that the configuration of the whole body at birth is analogous to that of the human fœtus; for, although the umbilical arteries have a similar distribution as those in man, the lower extremities in the fœtal horse bear the same proportionate size to the rest of the frame, or are even larger than at the period of mature growth.

There is an important object attained, in the act of parturition, by the diminutive size of the pelvis in the human fœtus, which has been overlooked in offering these explanations. In the human subject, the

axis of the pelvis, along which the infant has to be propelled, is nearly perpendicular instead of being horizontal as in other mammiferous animals. From this it follows that to ensure the safety both of the parent and of the offspring, the process of delivery must be slow and laborious *. Since the fœtus, therefore, in passing through the narrow canal of the mother's pelvis occupies a considerable time in its descent, it is necessary that the umbilical cord should be protected from compression; otherwise the supply of blood from the placenta, will be interrupted, and the life of the infant be destroyed before it can respire. Now it seems to be with the view of giving perfect security to the vessels of the cord, that the pelvis is restrained in its growth and is narrow and elongated in its form. As the head of the child, in the natural labour, descends first, no danger is incurred, however long this part may be delayed in its passage, because the circulation within the uterus continues free all the while. The head, therefore, descends slowly; and as it advances, it opens and dilates the orifice of the womb and the os externum, thus providing for the easy and rapid delivery of the rest of the body. But if it had happened that after the head was delivered, together with the abdomen and the first turns of the umbilical cord, a new source of difficulty was occasioned by the size

* It may be asked—Does not the remarkable peculiarity of gestation in the kangaroo derive some explanation from considering the erect position in which this animal carries itself, while running or springing on its hinder extremities and tail?

of the hips of the infant—for example, by their being of the same relative magnitude as in the adult, it is obvious that the blood-vessels of the cord, being impacted betwixt the hips of the fœtus and the brim of the pelvis, could not have escaped being fatally compressed. Happily, the pelvis of the infant, being small, it descends rapidly through the dilated passage of the cervix and vagina, and there is not time for the circulation in the umbilical vessels to be impeded. In breech presentations the order of the natural delivery is reversed; the smaller part is propelled before the larger, the cord, therefore, is exposed to compression during all the time that the head is descending; and it is this circumstance which gives rise to the principal alarm in these cases.

It thus appears that the capacious head and diminutive pelvis of the fœtus are provisions for its safe delivery from the womb. But the same configuration, it is obvious, would be incompatible with the privilege enjoyed by man of carrying his body erect. Accordingly, before the child can leave the nurse's arms, or before the human form is completed, there is a remarkable change in the proportions of the figure:—the pelvis and the legs, which form the base on which the trunk is sustained, become the larger and preponderating parts, while the head, upper extremities, and thorax are comparatively light. As an example of the extent of this alteration, the centre of gravity in the fœtus, immediately before birth, is situated as high up as the scrobiculus cordis, while in the adult,

according to Borelli, it is between the two hip-joints. With the view of obtaining a more accurate conception of the change which thus takes place in the relative proportions, the following measurements of the skeleton were made, in the infant newly born, and in the adult. The entire length of the child, measured for this purpose, was eighteen inches and a quarter; the dimensions of the adult were found by measuring four individuals, whose mean height was five feet eight inches. In the infant the length from the apex of the head to the highest part of the spine of the ilium, was two inches greater than the length from the same point of the ilium to the heel; that is, the length of the superior division exceeded that of the inferior by one-ninth of the entire height. In the adult, the upper division was *less* than the lower by sixteen inches; or, in other words, it was one-fourth of the whole height shorter than the inferior division. Upon comparing the size of the head with that of the pelvis a similar variation was observed: the circumference of the head in the newly born child was twice that of the pelvis; whereas in the adult it was less by nearly a half. Lastly, on contrasting the length of the arms and of the legs, it was found that in the child, the former, when measured from the acromion process to the tip of the middle finger, were exactly of the same length as the latter, measured from the greater trochanter to the heel; but in the adult the arms were twelve inches shorter than the lower extremities. In illustration of the same fact we may observe that the humerus in the fœtus,

near the sixth month, is equal, both in size and weight, to the femur; but at adolescence the femur is fully three times the weight of the humerus.

From these calculations we may perceive what a remarkable accession to its growth the inferior division of the body acquires in contrast with the superior division. We are authorized therefore to conclude that the lower extremities, including under that term the pelvis and the bones of the leg, advance with a greater activity between birth and manhood, than the head, thorax, spinal column, or upper extremities: and that it is owing to this difference in the rapidity of the development of the several parts of the frame that the human figure becomes changed, as we have observed, in its proportions.

Of the influence which Rickets has in retarding the growth and changing the proportions of the Skeleton.

If we revert now to the peculiarity of the conformation which characterizes the skeleton affected with rickets, we shall perceive that although it differs from the adult skeleton, it bears an obvious resemblance to that of the child:—the bones may be larger, they may have the firmness and strength which belong to the mature subject, the marks of the sutures and epiphyses may be obliterated; but the superior division of the frame preponderates over the lower as it does in infancy. Reflecting upon this

similarity, it is naturally suggested that the cause of the remarkable form of the ricketty skeleton must be a defect in the process of growth occasioned by the prevalence of that disease in the osseous system. If the interruption, which we are supposing, takes place while the change of the configuration just described is in the course of being accomplished, it is evident that the skeleton will retain in adolescence the peculiarities that belong to its primitive form. It might appear, at first sight, as if the peculiarity were owing to the defect of growth falling more exclusively upon the lower division of the frame than upon the upper, inasmuch as the bones of the pelvis and of the legs suffer a greater loss in their dimensions than the other parts. But this difference is to be accounted for by the process of development being more active in the lower extremities than in the superior division, as has just been shown; which makes the stoppage of the growth more strikingly exhibited in them.

The distorted skeleton, marked No. 3 in Table 1., was found to be of the same height, when measured along the course of its curvatures, as a girl whose age was eleven years and a half; they were both fifty-one inches and a half in height. But the following contrast was observed in their relative dimensions. In the girl, the length from the apex of the head to the spine of the ilium was eleven inches and a half less than from the ilium to the heel; but in the ricketty skeleton the superior division was only five inches and a half less than the inferior. The

arms of the girl were nine inches shorter than the extent from the ilium to the heel; but in the ricketty skeleton the difference was only three inches and a half. It thus appears, that if we desire to make a comparison between the natural skeleton and that of this deformed person, we must take the skeleton of a child still less advanced than this; that is to say, about three or four years of age.

If we reflect upon the nature of the morbid action in rickets, it will not appear improbable that it should be accompanied with a disturbance of the growth. Although the osseous system is principally affected in this disease, yet we have abundant proofs in the marasmus and constitutional disorder, (which is so general as to extend its influence even to the intellect, causing, most commonly, a remarkable precocity in the mental faculties,) that every function of the body is deranged. With regard to the bones, it is a mistake to suppose that it is the deficiency in the secretion of phosphate of lime which alone marks the disturbance in them. In addition to the process of softening, there is a disorganization of the minute textures of the bones, which equally demands our attention. This morbid appearance is exhibited upon making the section of a ricketty bone that has been removed during the active stage of the complaint; and it is described by various pathological writers.—Thus we find it stated by Bichat, while explaining the effects of this disease, "that the solid structure, forming the walls of a long bone, entirely

disappears; the whole interior presents a homogeneous appearance, and is composed of cellular texture throughout."* In the bones of the skull the derangement of the minute textures is commonly exhibited in a very remarkable manner,—some parts of the calvarium being increased to an extraordinary degree in thickness, while other parts are reduced to the thinness of paper, and the divisions of the tables are lost†. It may be argued that since there are such extensive changes in the deposit of the material composing the osseous structures generally, it is a proof that the laws which regulate the formation of the internal substance of the bones are disturbed in rickets; and if such be allowed, it is natural to conclude that the course of development, by which these individual bones increase, at different and appropriate rates according as they are in the upper or lower divisions of the frame, is also deranged.

* Bichat quoted by Mr. Stanley. See the Transactions of this Society, Vol. VII. p. 406.

† Sir Charles Bell has in his possession a skull affected with rickets, in which the parietal bones are seven-eighths of an inch in thickness at their central parts. He had also the skeleton of a child seven years of age, in which the parietal bones measured five-eighths of an inch. In both these specimens the calvarium was remarkably thin in the situation of the sutures and fontanelles. Hunauld exhibited to the Academy of Sciences the skull of a child between three and four years of age, in which the bones of the skull-cap were, in some places, seven or eight lines in thickness; and when squeezed with the fingers, blood and serum oozed from the interstices of the bone.

Of the relative Proportions in Dwarfs and in tall Individuals.

The examples of dwarfs and of persons whose height surpasses the common standard, serve to illustrate our subject. They shew how much the relative proportions of the body may be varied according as the growth is either retarded or accelerated. In the dwarf, where the development is a slow and imperfect process, the superior half of the body retains, at maturity, the same preponderance over the lower, which naturally belongs to it at birth. An interesting example of this is to be seen in the skeleton of the dwarf, Crachami, preserved in the Museum of the College of Surgeons. Although this individual lived to the age of nine years and a half, the skeleton exhibits the very same relative proportions which belong to the infant at the age of two or three months; indeed, if it were not for the advanced condition of the teeth, the closing together of the sutures, and the general firmness of the bones, we should not be able to distinguish it from a skeleton of that early period. In the same Museum there are the portraits of five other remarkable dwarfs, among which is that of the Polish dwarf Boroawloski; and in him the peculiarity which is here described is very distinctly presented. It can at once be observed, that although his features, and the court dress with which he is equipped, bespeak a person of mature years, the size of his head, the length and capaciousness of his body, the narrowness of his hips,

and the disproportionate shortness of his legs, betray the original configuration of the child. It accordingly appears that the proportions of the dwarf correspond with those of the individual affected with rickets; for in both the lower division of the body fails to acquire that superiority of bulk over the upper division which naturally belongs to the figure in adolescence.

But as the interruption to the process of growth causes the adult to retain the peculiarities of the child's figure, so it may be shown that the acceleration of the process makes the tall individual become a true caricature of the mature form. The lower extremities being endowed with a superior activity of development, they expand and elongate in the tall person, under the increased impulse given to the whole growth, with a rapidity that soon destroys the proportions of the body. Thence it is a general remark, that persons distinguished for their unusual height, have their lower limbs disproportionately long, in comparison with the size of their trunk. To illustrate this, I took the measurements of a gentleman whose height was six feet four inches and a half, and contrasted them with the measurements of an individual, of the proper proportions, whose height was five feet eight inches. It was found; in the first place, that the length from the apex of the head to the spine of the ilium, was only half an inch greater in the tall person than in the other; but below the same point of the ilium the tall individual measured as much as eight inches more than the other. 2dly,

The circumference of the head was only one inch and a quarter greater in the tall individual than in the person of common proportions; but in the pelvis the difference amounted to seven inches. 3dly, The length of the arms in the tall person was less than that from the spine of the ilium to the heel by sixteen inches; while in the other individual the difference was only eleven inches and three quarters. This shortness of the arms, contrasted with the length of the legs, would have caused, it is obvious, a remarkable deformity of the figure, if the vertebral column had not also been peculiarly short: but the spine, being comparatively defective in height, allowed the arms to hang down to their usual extent in this gentleman, and thus the difference in the relative length of the upper and lower limbs was not easily noticed; yet it is to be observed that the increase in the length of the arms was only equal to the half of what it was in the lower extremities. 4thly, The difference between the length of the upper and of the lower divisions amounted, in the tall individual, to one-third of his entire height; while it was only one-quarter in the person of common proportions *.

* It is a general remark respecting tall persons, that their extraordinary height is unnoticed while they are sitting at a table, and that it is only when they rise from their chair that a feeling of surprise is excited. Those who reside in London have the opportunity of observing the effects of this law, in the soldiers of the life guards: and no one can pass these fine looking men, especially when they are in undress, without entertaining some speculations about the remarkable shortness of their waists, shown by the diminutive size of their jackets, as contrasted with the prolonged dimensions of their lower extremities.

Of the influence possessed by Rickets in arresting the Growth of the Pelvis.

The questions which we have been engaged in considering, have led us to observe a remarkable character in the pelvis when deformed by rickets, which has not been noticed by writers upon midwifery, but which appears, nevertheless, essential for comprehending the true condition of this circle of bones in such cases. It will be found that these authors, while treating of the effects of this disease upon the pelvis, confine their observations to the deformity of the bones, and to the encroachment produced upon the cavities by that cause; and that they attribute all the dangers met with in parturition to the irregularities only of the form of the canal. But after contemplating the imperfect course of development in the body when affected by this disease, and observing, in particular, the extensive change which ought naturally to be effected in the size of the pelvis in the female during that process, we are prepared to comprehend how two distinct causes are in operation to diminish the capacity of the brim and of the outlet: viz. first, there is the softening of the bones, arising from the want of phosphate of lime, and giving rise to deformity; and, secondly, there is the defective growth and consequent imperfect expansion of the cavities of the pelvis as compared with the development of the other parts of the body. This diminution of the size of the bones, it was formerly shewn, amounted to nearly a quarter of the natural dimensions. We may conceive, therefore, the influence which the stop-

page of the growth, independently of the deformity of the bones, must have in obstructing the course of delivery; and we might even suppose that the narrowness of the canal, resulting from this cause alone, even if the pelvis retained its natural shape, would lead to the most serious results. It may, at all events, be perceived how imperfect the calculations must be, whether made with the pelvimeter or by any other means, with the view of ascertaining the dimensions of the ricketty pelvis, when the natural and full sized bones of the healthy subject are taken as the standard of comparison. In the pelvis deformed by rickets, it is not only those diameters, which are contracted by the thrusting inwards of the bones, that are smaller than usual, which would be the case if the distortion were merely effected by the yielding of the bones,—but all the diameters are less than natural. In squeezing a hoop, in proportion as one diameter is diminished, the other is elongated : and so it is in the diameters of the pelvis distorted by mollities ossium: but this is never the case in rickets.

If we refer to the Table No. 1., it will be perceived that a correspondence may be traced in the diminution of the bones of the pelvis and those of the leg; that is, in proportion as the bones of the leg are shorter than natural, the pelvis is in a corresponding measure smaller in all its dimensions. Hence it may be suggested as a means of estimating the extent to which the pelvis is diminished below its natural size, to observe the proportions which the length of the legs bears to the rest of the frame. This correspondence

in the deficiency of growth between these two parts, is what we might naturally expect, since in the healthy development they expand and elongate with a similar activity. It may corroborate the same view, that whenever one of the lower extremities is "wasted," or more properly, is arrested in its growth, owing to fever or derangement of the health during childhood, not only are the femur, the tibia, and fibula, and the bones of the foot diminished in size, but the os innominatum of the same side is likewise affected in a similar degree. In one of the skeletons, of which the measurements are given in the Table, there was this partial wasting of one of the lower extremities combined with the general deformity of the bones; viz., the left leg was two inches shorter than the right, and the muscles also were proportionately smaller. Now it was observed, on examining the left os innominatum, that the defect in its growth corresponded with the diminution of the leg. Here, then, it might be said, that both the right and the left lower extremities were examples of the law referred to; for as there was a general stoppage of the growth, neither of the limbs possessed its true proportions; yet each of the ossa innominata bore a relation in its size to the corresponding extremity. An analogous effect is observed when the arm is similarly affected; for the scapula and clavicle, which may be considered as corresponding to the os innominatum, are stopped in their development in the same proportion as the bones situated below the shoulder joint*.

* Sir Charles Bell has in his possession a preparation, which illustrates in a striking manner this general wasting of the

Is Rickets to be considered the Cause of the lateral Distortion of the Spine which commences at the age of Puberty?

I may be allowed, before concluding, to draw attention again to the theory which supposes that rickets is the cause of the common lateral curvature of the spine, which commences about the age of ten or twelve, and is a frequent complaint in young females. Now, it would appear that this opinion may be entirely overthrown if we attend only to the effects which rickets has upon the development of the body, as shown in the preceding observations. In the cases of distortion occurring subsequent to early childhood, we shall discover that even while the spinal column is increasing in its curvature, and while the ribs are becoming more and more twisted, and therefore, when it may be supposed that the disease, if it be rickets, is most active in its progress, the pelvis continues to expand and the limbs to elongate, just as in the natural process of growth. Hence the patient is commonly observed to gain in height, at the very time that the spinal column is losing some inches of its proper length. And an obvious distinction in the general proportions of the figure in

bones of the upper extremity. To confirm what is stated in regard to the os innominatum being affected in conjunction with the other bones of the extremity in wasting of the limb, I may refer to an interesting account of the dissection of a patient who had this kind of deformity, by Lobstein, who has added the different measurements of the two sides of the pelvis. See the "Report of the additions made to the Strasbourg Museum." 1822.

the two kinds of deformity, is the consequence of this difference of the growth. For example, in the person deformed by rickets, the trunk, when contrasted with the size of the limbs, appears to be considerably larger than natural, notwithstanding the curvatures in the course of the spine; whereas, in the individual, who has the common lateral distortion, there is a shortness and squareness of the trunk; and the lower extremities, besides being perfectly straight, appear to be of a disproportionate length to the rest of the body.

When we consider the imperfect manner in which this theory has been advocated *, we cannot help surmising, notwithstanding our respect for the authors who have maintained it, that they have resorted to it more because there was a difficulty of explaining the origin and progress of the common lateral curvature without supposing some diseased action in the bones, than because there was a resemblance in the history or symptoms or pathological appearances to what are found in rickets. The same remark applies to the various, opposite, and inconsistent opinions, which are founded upon its being scrofulous inflammation that

* It is forgotten that the common lateral distortion of the spine prevails, nearly exclusively, in the families of the rich, whereas rickets is scarcely ever found except among the children of the poor, who are miserably fed, badly clothed, and live in the narrow streets of large cities in a confined and unhealthy atmosphere. Again, rickets attacks the children of both sexes with equal frequency; which is different from what is observed in the common lateral curvature.

produces lateral distortion; some authors conceiving, according to this supposition, that the morbid action extends along the whole vertebræ of the spine, missing the joints or ligamentous textures; and others, on the contrary, supposing that the inflammation is confined to the intervertebral cartilages and ligaments avoiding the osseous textures. Notwithstanding its being imagined that such an extensive portion of the body is affected with active disease, no distinct symptoms are described as accompanying the complaint. Indeed, we know in practice, that it is not the condition of the spine which first attracts the notice of the friends of a patient who has the common lateral curvature; but what occasions alarm is the displacement of the scapula, the prominence of one of the mammæ, or the bulging out of one of the hips; and there is neither pain in the course of the spinal column nor the slightest feverishness to denote the presence of inflammation. The treatment, it is also to be remarked, recommended for this supposed scrofulous inflammation, is altogether inconsistent with what ought to be pursued, if such a morbid condition existed, being violent gymnastic exercises of various kinds, or powerful stretching of the spine, which would undoubtedly bring on caries of the bones, extensive suppuration, with paralysis of the limbs. But the worst effects which are to be dreaded from such theories is, that the pathology being incorrect, practitioners may be led to treat those cases of deformities, which really proceed from the disease here described, and which in some instances nearly resemble

lateral distortion in outward appearance, as well as in the want of pain and distinct symptoms, as if they had the same origin as the common lateral curvature and could bear the same severe measures *.

Before assuming that such formidable diseased actions gave rise to the common lateral distortion, it is remarkable that the authors have not attended more to the natural softness of texture and natural flexibility, both of the spine and the ribs, which are peculiar to the period of life when this deformity commences;—and which condition is characteristic more especially of the bones of young females. As there are, however, certain circumstances unconnected with disease, which tend to increase the natural weakness of these parts, and to render them still more liable to become distorted from slight causes, I may be permitted shortly to enumerate them. 1st. The restraints to which young girls, especially in the higher classes of society, are subject, owing to the system of their education, as they interfere with the natural exercise of the body, deprive the muscles of the spine of their strength; and tend also to make the bones and the ligaments more spongy and weak. 2nd. This debility of the muscular frame makes it irksome for the young patient to sit with the spine erect for any length of time; and accordingly, a disposition to lounge or to stoop is the consequence:—thus the weight of the body, instead of being sustained

* See Delpech "De l'Orthomorphie," Vol. II. p. 362, et passim.

perpendicularly upon the spinal column by the active exercise of the muscles, is allowed to hang, as it were, upon the ligaments which bind the processes of the vertebræ together, and these parts become unnaturally elongated. It is in this manner that the numerous joints of the spine, amounting to seventy-two, become relaxed, and are prepared to yield in whatever direction a particular habit may induce them. 3d. The spinal column represents a pillar of a very remarkable structure; it is not only flexible, and made to sustain a perpendicular weight, but it is supported upon a basis that is constantly shifting its level. The pelvis, on which the spine rests, is seldom for a moment placed horizontally. For example, the natural position of ease while standing, is to stand upon one leg; and accordingly the pelvis, in this posture, is necessarily elevated above its natural level on that side, and depressed below it in a corresponding degree on the other. The consequence of this inclination at the basis of the spine is that the lumbar vertebræ which are next to the pelvis, and which form together the most flexible part of the spine, are also raised unequally in one direction and fall obliquely aside on the other. Hence, in order to preserve the equilibrium, a curvature of the spine takes place in the lumbar vertebræ, while standing upon one leg. 4th. There being this curvature formed at the base, it follows that the weight of the body falls more upon the concave side of the spine than upon the convex. But it has not been observed what are all the consequences which result from this. If we attend

to the natural structure of the spine, it will be seen that whilst we lean the body to one side, the pressure is thrown, almost exclusively, upon the articulating processes of that side; these processes, delicate as they are, being the only bony structures which check the lateral movements of the trunk. Hence when a habit is acquired of inclining to one side, or of resting upon one hip, as in sitting, the sharp edges of these small points of bone receive the weight of the entire body. But as the articulating processes are remarkably soft, and are imperfectly formed at the age of puberty, it follows that they will become wasted by absorption when this position is long persisted in; and an inequality of the length of these two lateral props, on which the vertebræ rest posteriorly, will be the consequence, those of the concave side being shorter than those of the convex. 5th. In lateral curvature of the spine we have a distinct demonstration that the articulating processes give way more extensively than any of the other parts of the column. This is evinced by the rotation which the spine makes in its perpendicular axis, at the same time that it inclines laterally. The joints of the articulating processes being situated posteriorly as well as laterally, the spinal column cannot yield in their direction, without wheeling partially round; and it is owing to this rotation that the transverse processes, and the ribs, are directed obliquely forward upon the concave side and obliquely backwards upon the convex side of the curvatures, thus giving rise to a fulness or swelling on the one hand, and a depression or sinking inwards on the

other *. 6th. When a curvature is established in the lumbar vertebræ, it is easy to understand that a second one must follow higher up, produced by the natural efforts of the body to correct the inclination thus formed at the base of the column. With a view to preserve the equilibrium, which is disturbed, in consequence of this curve, whenever the pelvis assumes the horizontal position, one of the shoulders is elevated and the head turned aside, causing a bend to take place in the dorsal region of the spine, in an opposite direction to that situated in the lumbar. 7th. If it be admitted that in standing, we have a natural preference to use the right leg, as being the strongest and that with which the chief efforts are made in the powerful exertions of the limbs, we may comprehend

* This difference in the appearance of the two sides of the spine, has given rise to various speculations respecting "hypertrophy" and "atrophy" of the muscles of the back in spinal distortion. Dr. Quain, in his "Elements of Descriptive and Practical Anatomy," p. 363, has attempted to prove that the small muscles of the dorsal region of the spine, situated upon the convex side of the curvature, produce the inclination of the column at this part; that is, he conceives that these muscles, being affected with hypertrophy, can turn this highly inflexible part of the spine in the opposite direction from which they themselves act. But this is surely to be considered an oversight of that accomplished anatomist. Dr. Mason Good, founding upon the same opinion that an irregular contraction of the muscles gives rise to deformity, has included the common lateral curvature of the spine, in his new arrangement of diseases, among the spasmodic complaints;—where we find it classed by the side of hydrophobia, tetanus, priapismus, &c., and entitled by him "Entasia Rachybia." See the last edition of Dr. Good's "Study of Medicine."

how the curvature of the lumbar region of the spine is so frequently directed with its convexity on the left side of the body, and the curvature in the dorsal region, with its convexity on the right side. The former curve results from the pelvis being depressed on its left side, as a consequence of standing upon the right leg; this inclination of the pelvis throws the spine to the left side, making it bend to the right in order to correct the want of balance. As this curvature in the loins becomes habitual, but can only be maintained while the pelvis continues oblique, the incurvation of the dorsal region must necessarily be to the left side, or in a direction opposite to the former.

If it be admitted from the preceding observations, that rickets has no share in producing this variety of distortion which is so frequent in females, it is obvious to what an extent the number of cases must be abridged, in which the question as to the form of the pelvis becomes a source of anxiety during pregnancy. When the accoucheur meets with a true case of deformity of the spine from rickets—he will not, it is hoped, be deceived by the notion which at present too generally prevails, that it is a mere accidental circumstance, whether the pelvis in this complaint be included or not in the distortion. He will reflect, on the contrary, that if this disease has attacked the osseous system, two causes have been in operation to diminish the size of the pelvis, and having a more correct knowledge of the different sources of the dangers in such cases, he will be prepared to meet them with greater promptitude.

TABLE I.—FEMALE SKELETONS DEFORMED BY RICKETS.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	Average measurement of distorted skeletons.	Natural female skeletons.	Difference.
Skull—its circumference	19½	20	22	..	21	20	22	..	..	..	..	..	..	..	..	22½	21	22	1
Spine following the curvatures anteriorly	21¾	23½	21	20½	23½	23	23½	24	..	..	..	..	..	..	..	..	22⅝	23½	⅞
From the acromion to the tip of the middle finger	22½	23½	25	..	25¾	25	24	..	..	..	..	..	..	..	24	26	24½	27	2½
Greatest breadth of the pelvis from one spine of the ilium to the other.....	10⅓	9¾	9½	10¼	11	10	10	10	10	10½	9⅛	9⅛	9½	8½	..	..	9⅖	11¼	1 15/28
From pubes to sacrum	1⅝	3	2½	2	2⅞	3¼	2½	2	3	3⅜	2⅝	2½	2⅞	2¼	..	..	2⅛	4½	1 3/14
From highest part of the spine of the ilium to the lowest part of the ischium.	6¼	6	6¾	6½	7	7	7	6	7	7	7⅜	6⅝	7	6	..	..	6⅖	8½	1 11/14
From ant. sup. spinous process to post. sup. spinous process	5	5¼	5½	5⅓	5¼	5½	5½	5½	5½	5½	5½	5⅜	5⅝	5	..	..	5⅜	7¼	1⅞
From trochanter to the heel following the curves.....	22½	21	25	23½	25¾	25	28	..	..	..	..	..	..	..	22½	24	24½	35	10½
Length of the femur.....	10	10½	12	10	12	14¼	13	..	..	..	..	..	..	..	..	..	11⅖	18	6⅗
Round the knee.....	8½	9½	9	8½	8½	8½	8½	..	..	..	..	..	..	..	..	..	8⅖	10½	1 11/14

TABLE II.,

SHOWING

THE CHANGES IN THE RELATIVE PROPORTIONS OF THE FIGURE DURING GROWTH.

Years.	Entire height in inches.	Above spine of the ilium.	Below spine of the ilium.	Arm, acrom. to tip of finger.	Circum. of the head.	Circum. of the hips.
Fœtus at 5th month	$9\frac{1}{8}$	$5\frac{1}{8}$	4	$3\frac{6}{8}$	$6\frac{1}{4}$	$3\frac{1}{2}$
At birth.....	$18\frac{1}{4}$	10	$8\frac{1}{4}$	$8\frac{1}{4}$	$13\frac{3}{4}$	$6\frac{1}{2}$
2	$28\frac{1}{2}$	$14\frac{1}{2}$	14	$11\frac{1}{4}$	$16\frac{3}{4}$	11
$3\frac{1}{2}$	37	17	20	15	$20\frac{1}{2}$	$19\frac{1}{2}$
8	$44\frac{1}{2}$	$19\frac{1}{2}$	25	19	$19\frac{3}{4}$	$18\frac{3}{4}$
$11\frac{1}{2}$	$51\frac{1}{2}$	20	$31\frac{1}{2}$	$22\frac{1}{2}$	$20\frac{1}{2}$	$24\frac{3}{4}$
14	$55\frac{1}{2}$	20	$35\frac{1}{2}$	$22\frac{1}{2}$	21	$26\frac{1}{2}$
16	$62\frac{1}{2}$	$22\frac{1}{2}$	40	$28\frac{1}{2}$	$21\frac{1}{2}$	31
21	68	26	42	$30\frac{1}{4}$	22	35
—	72	$25\frac{1}{2}$	$46\frac{1}{2}$	$33\frac{1}{4}$	$22\frac{3}{4}$	39
—	$76\frac{1}{2}$	$26\frac{1}{2}$	50	34	$23\frac{1}{4}$	44

SKELETONS OF THE GIANT AND DWARF PRESERVED IN THE COLLEGE OF SURGEONS.

					(Skull.)	(Pelvis.)
—	93	37	56	41	$23\frac{3}{4}$	37
$9\frac{1}{2}$	$19\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{1}{4}$	$8\frac{1}{2}$	14	$8\frac{1}{2}$

RELATIVE WEIGHTS OF FŒTUS AND ADULT FEMALE.

	Total.	Above spine of ilium.	Below spine of ilium.	One Upper extremity.
5 months....	ʒviiss	ʒxlvii$\frac{7}{10}$	ʒxii$\frac{3}{10}$	ʒiii$\frac{8}{15}$
Adult female	℔lxxvii. ʒvii	℔xxxviii ʒss	℔xxxix ʒviss	℔v ʒv$\frac{3}{4}$

30, Lower Brook Street.

A DESCRIPTION

OF

THE APPEARANCES

OBSERVED IN A

CASE OF DOUBLE UTERUS,

IN WHICH

IMPREGNATION HAD TAKEN PLACE,

WITH

REMARKS ON THE

STRUCTURE AND FORMATION

OF THE

MEMBRANES OF THE HUMAN OVUM.

By ROBERT LEE, M.D. F.R.S. Secretary.
PHYSICIAN TO THE BRITISH LYING-IN HOSPITAL.

READ MAY 22, 1832.

On the 2d of August, 1831, I was present with Dr. Sims and Mr. Morley of Leicester Square, at the examination of the body of a woman who had died eight days subsequent to parturition, from inflammation of the peritoneum, appendages and veins of the uterus. She had previously borne several living children, but nothing unusual occurred during labour

on any of these occasions. The uterine organs were found on dissection to be malformed, and several remarkable appearances were observed in their structure, of which the following is a short history. The accompanying preparation of the parts, with a drawing and model in wax, will enable the members of the Society to verify the accuracy of the description *.

The body of the uterus was cleft as it were down the middle, from the fundus to the cervix, so as to form two lateral halves which opened into the cervix, like the uterine cornua of most mammiferous animals. The cervix, os uteri, and vagina presented the ordinary appearances observable at the same period after delivery. The right cornu had contained the fœtus, and it did not differ perceptibly in its form and size from the uterus in common cases a week after delivery. Coagula of the fibrine of the blood were found closing the semilunar orifices of the uterine sinuses, and the whole inner surface was lined with rough irregular flakes, of deciduous membrane, or a layer of the fibrine of the blood. One ovarium and one Fallopian tube were connected with this cornu, and the same was the case with the unimpregnated cornu. Both ovaria were enlarged, but the right was much larger than the left, and contained a corpus luteum. In the left ovarium no corpus luteum existed.

* See Plate II.

The left cornu was about the ordinary size of the unimpregnated uterus. Its parietes when divided were observed to be unusually soft and vascular, and its internal surface was every where coated with a delicate and beautifully formed deciduous membrane. At the opening of the cornu into the cervix, the deciduous membrane formed a shut sac, but it presented a smooth circular opening at the uterine orifice of the Fallopian tube. The fibres of this membrane as they approached the opening of the tube, ran in a converging direction like radii to the centre of a circle, and passed into the opening, leaving it completely pervious, although of the ordinary small dimensions. The distance to which the fibres of the deciduous membrane extended into the Fallopian tube could not be clearly ascertained, nor was it positively determined if the whole extent of the canal of the tube was open.

In the works of different authors, various irregularities in the formation of the human uterus have been described, under the terms bilocular, bicorned, bifid or double uterus, in all of which, without a single exception, the uterine appendages have been simple, or have consisted of one ovarium and one Fallopian tube annexed to each cornu of the uterus, and not of two ovaria and two Fallopian tubes, as the term double uterus would seem to imply. In the examination of a great number of children at the Maternité of Paris, the division of the uterus, as in the case now related, was often met with. Professor Chaus-

sier has described the case of a woman who was delivered in the Maternité of her tenth child, in whom it was found after death, that the right side of the uterus existed, with one ovarium and one Fallopian tube*. Littre, in dissecting the body of a little girl, found the vagina divided by a fleshy perpendicular septum into two equal cavities. Vallisneri relates the history of a woman who was poisoned by cantharides, in whom two uteri were found to exist, one of which opened into the vagina, the other into the rectum †. M. Cassan has referred to numerous other examples of similar malconformations of the uterine organs, and to those more particularly which are contained in the Memoirs of the Royal Academy of Sciences ‡. In the Museum of the Royal College of Surgeons, there is a specimen of bifid unimpregnated uterus, and another was preserved in the collection of Mr. Brookes, in which the fundus, cervix, and os uteri, were all divided by a thick septum.

The whole of these malformations have been reduced to the four following varieties, which have been accurately delineated by Messrs. Lauth and Cruvelhier. 1st. Where the uterus and vagina are separated into two cavities by a septum running in the direction of the mesial line, while the external confi-

* Bulletin de la Faculté de Médecine, Paris, 1817.

† Esperienze ed Osservazione spettanti all' Istoria Naturale, &c. l. 4.

‡ Recherches sur les cas d'Uterus Double et de Superfœtation ; par A. L. Cassan. Paris, 1828.

guration of the uterine organs presents nothing unusual. 2dly, Where the fundus and body of the uterus were divided into two cornua; the cervix, os uteri, and vagina remaining in the normal state. 3dly, Where the uterus is bifid, as above, while the cervix and vagina are also divided by a septum. 4thly, Where the vagina forms a single canal with a double os uteri.

All these deviations from the natural formation of the uterus, have been referred by Meckel to a suspension of the development of the parts, in consequence of which the uterine organs manifest, during the whole of life, some of the conditions peculiar to the embryonic state. This principle, indeed, explains some of these varieties of malformation, as for example, those which have been classed by Blumenbach under his genus of monstra per defectum; but in the cases where redundant parts are met with, it is wholly inapplicable, and physiologists cannot at present account for these in a satisfactory manner.

Morand, Bartholin, Tiedemann, Ollivier, and Dr. Blundell relate cases of double uterus, in which impregnation had taken place, and the fœtus had been retained till the full period. None of these authors have alluded to the presence of a deciduous membrane in the unimpregnated cornu of the uterus: but that it is formed in all similar cases, appears probable from this circumstance, that in the gravid uterus of the lower animals, the membrane which surrounds

the product of conception, invariably occupies the whole inner surface of both cornua.

The disposition of the deciduous membrane, in the case I have now related, must have rendered superfœtation, or the conception of a second embryo during gestation, impossible, and its history tends entirely to overturn the recent speculations of M. Cassan also, on the possibility of superfœtation where a double uterus exists. Menstruation must have been equally impossible in this case, as in ordinary pregnancy, where the inner surface of the uterus is lined with decidua.

The most remarkable example of impregnated double uterus which has perhaps ever occurred, is the following, which has been recorded by Dr. Purcell, of Dublin, in the Philosophical Transactions, Vol. LXIV. p. 474.

"Last summer (1773) the body of a woman who had died in labour, in the ninth month of pregnancy, was dissected in the Anatomical Theatre of Trinity College. Upon opening the abdomen, an uterus appeared of such a size and form as is usually observed at that period. It contained a full grown fœtus, but was furnished with only one ovarium, and one Fallopian tube, which were situated on the right side. On the left was placed a second uterus, unimpregnated, and of the usual size, to which the other ovarium and tube were annexed. But these two uteri were

wholly distinct and separated from each other, except at the lower extremity of their necks, where their union extended a quarter of an inch, and an acute angle was formed between. There was nothing extraordinary in the formation of the external parts of generation; but from each side of the meatus urinarius a membrane ran downwards, and the two having comprehended this orifice between them, were joined together a little below it, so as to form by their union a septum or mediastinum, which taking the remainder of its origin from all that hard ridge called the superior columna, so as to extend from the entrance of the vagina as far backwards as its posterior, and thus divide it into two tubes of nearly equal dimensions. But each of these did not lead to the womb of its own side; for the right vagina became gradually wider as it ran backwards, and at last was so far dilated as to comprehend within its circumference the orifices of both uteri, while that on the left side having taken an oblique direction, ended in a cul de sac or cœcum."

The preparation of the parts thus described, was afterwards purchased by Mr. Hunter, and is now in the Museum of the Royal College of Surgeons in London, and forms one of the most valuable specimens in the Collection. Dr. Purcell having omitted to lay open and describe the condition of the unimpregnated cornu, I applied to the Board of Curators for permission to examine this part of the preparation, to determine if it were lined with a deciduous mem-

brane, and if the uterine orifice of the Fallopian tube were open. Permission was readily granted, and the necessary examination was made in the presence of Mr. Clift and Mr. Owen, but no trace of deciduous membrane could be detected, and even the internal membrane of the left cornu appeared to be wanting. It is impossible now to determine whether these membranes were removed artificially when the part was laid open by Mr. Hunter, after it came into his possession, or if they subsequently disappeared from decomposition during the lapse of fifty-nine years. Prior to the examination, the impression upon Mr. Clift's mind was, that when the left cornu was first laid open, a deciduous membrane had been discovered lining its surface.

Numerous experiments have been made on the lower animals, to determine the changes which take place in the ovaria subsequent to impregnation,—the period which is required by the germ or product of conception to traverse the Fallopian tube,—the power by which it is propelled into the cavity of the uterus, and the various forms it afterwards assumes in the progress of its development. In the human subject, the opportunities which physiologists have enjoyed of observing these changes in the uterine organs immediately after conception, have been so few, that the knowledge we possess of these changes is almost wholly derived from researches made on the deer or smaller quadrupeds.

Mr. John Hunter dissected the body of a young woman, who was supposed to be a month pregnant. The uterus was large and soft, and on its inner surface there was a pulpy substance, which was penetrated by the uterine vessels. This pulpy substance was so thin as to resemble the retina of the eye. The uterus was placed in a basin filled with clear water, and examined with the utmost care; but even with the help of a magnifier, the presence of the embryo could not be detected *.

Sir Everard Home relates the case of a young woman, who was supposed to have become pregnant eight days before death. The internal surface of the uterus was coated with an exudation of coagulable lymph, and a small ovum was concealed near the cervix uteri, in the midst of long filaments of coagulable lymph. The os uteri was completely closed with a firm gelatinous matter, and the two orifices at the superior angles of the uterus, by which this viscus communicates with the Fallopian tubes, were open. The embryo was detected by Mr. Bauer, with the help of the microscope. The cases I am about to relate, render it more than probable, that in this instance impregnation had taken place at least a month before the period supposed by Sir Everard Home †.

* Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, Vol. XI. p. 63. 1800.

† Philosophical Transactions, 1817, Part 2. p. 252.

Mr. Alexander Shaw has furnished me with the following interesting description of three specimens of the uterine organs after recent impregnation. These preparations, which I have carefully examined with him, were formerly in the Collection of Sir Charles Bell, and formed part of the Museum which was made under his superintendence for the London University, where they are now preserved. In all of these the orifices of the Fallopian tubes were visible at each angle of the fundus, or presented the same appearances which they exhibit in the unimpregnated condition of the organ.

1*st. Preparation.*—The woman from whom this uterus was taken, had her leg crushed by the wheel of a waggon. The limb was amputated and she died on the fourteenth day after the accident. She had informed the nurse, that she was in the sixth week of pregnancy. Upon examining the body the viscera of the pelvis were removed, and their blood-vessels injected with size and vermilion.

The uterus was nearly twice as large as it is in the unimpregnated state, and this organ together with the ovaries, the Fallopian tubes, and the alæ vespertilionis were in a remarkable manner loaded with blood. This vascularity was not like the effect of inflammation, but of excitement, the parts being soft and pliant, and without adhesion or extravasation. The left ovarium had a more turgid appearance than the right; it contained a corpus luteum, and a

bristle could be passed through the rent in the peritoneal covering at this part. The walls of the uterus were three quarters of an inch in thickness; there was an accumulation of mucus in the cervix and os tincæ, and the glandulæ Nabothi were enlarged.

Upon exposing the cavity of the uterus it was seen to be intensely vascular, the brilliancy of its colour having a resemblance to that which is produced when a portion of intestine in a young person is successfully injected. This vascularity was found to belong solely to the membrane which lined the inner surface of the uterus, and this being examined was discovered to be a true membrana decidua. Its surface was villous, and smooth in all its extent, it was confined to the body of the uterus; and the cervix accordingly, from wanting this vascular membrane, appeared almost free from injection, and nearly white.

The uterus was dissected with the view to expose the orifice of the left Fallopian tube; that is, on the same side on which the corpus luteum was discovered. When the angle at which the tube enters was laid open, a distinct channel was seen, formed in the deciduous membrane, and leading to the point where its opening is naturally found. This passage and the opening into the tube were free; so that a bristle could be introduced into the orifice and met with no obstruction, until it was fully inserted within the

walls of the uterus; here, owing to the calibre of the tube being naturally very small, and the course being somewhat difficult to follow, some force was required to be used. It appeared as the result of the examination, that the Fallopian tube, after traversing the parietes of the uterus, opened into the deciduous membrane with a distinct orifice; just as it does in the unimpregnated condition into the natural cavity of the womb.

Nothing that appeared like an ovum could be discovered, either in the Fallopian tube, or in the uterus, although it was searched for with care.

2*nd. Preparation.*—The young woman from whom the next specimen was obtained, terminated her existence by poison. The fundus of the uterus was turgid with blood, and upon the surface of the right ovarium was a red blotch resembling ecchymosis. The parts were therefore removed from the body and immersed in alcohol for more minute examination. The uterus was increased somewhat beyond its natural size. On opening the cavity, a deciduous membrane was discovered, compact as it is usually found to be, on the surface in contact with the uterus; but soft and velvety on the interior; and occupying the body of the uterus alone. There was a firm plug of mucus contained in the cervix and os tincæ.

The orifices of the Fallopian tubes were visible at

each angle of the fundus, or presented the same appearances which they exhibit in the unimpregnated condition of the uterus. A bristle could be introduced into them; but as in the former preparation, owing to the narrowness of the canal, there was an obstruction when it arrived at the part where the tube is enclosed within the parietes.

The ovarium of the right side presented an interesting appearance. Nearly one half of this body was turgid with blood, while the remaining part was of its natural whiteness. In the centre of the gorged part a vesicle was observed on the surface; which had burst and was more darkly coloured than the surrounding parts. When a section was made through this vesicle, the proper corpus luteum was exposed somewhat deeper. It was of the shape nearly of a kidney bean, was circumscribed, and could have been dug out from the ovary with the handle of the knife. It consisted of a clot of blood surrounded with a firm membrane. This enveloping membrane was about a tenth of an inch in thickness, and as it encompassed the clot of blood, it was thrown into numerous duplicatures on its inner surface. These duplicatures being white, while the blood inserted between them was of a dark brown colour, presented a contrast like what is seen in the molar teeth of the RODENTIA when the surface has been ground down to expose the layers of enamel, and this appearance of the clot has been described as resembling the oak leaf. This cavity containing the effused blood was distinct; and could be observed to

have a communication with the vesicle which was situated more superficially. This was by means of a canal about a sixth of an inch in length, and the borders of which were formed by a continuation of the same dense membrane which surrounded the corpus luteum. The calibre of this canal could only have permitted a bristle, of the smallest size, to lodge within it; yet it was easily discerned, owing to the stain of blood left in its centre, being contrasted with the whiteness of the margins.

Both Fallopian tubes contained a quantity of turbid fluid which resembled serum that had been thickly mixed with flocculi of lymph, and the same lymph adhered to the inner surface of the tubes. No appearance of an ovum could be observed.

3rd. Preparation.—The uterus of a young woman nineteen years of age, who destroyed herself by swallowing half a tea-cupful of sulphuric acid, and survived only twelve hours, was next submitted to inspection. Upon examining the uterus, it was found to be larger and softer than in the unimpregnated state. On slitting it open a gelatinous deposit was found in the cervix, and a deciduous membrane occupied the proper cavity. Adhering to the fleecy decidua and situated at the fundus, Sir Charles Bell found a small body distinguished by its putrescent colour, and this he imagined might be the ovum.

The orifices of the Fallopian tubes, as they enter the cavity of the uterus, presented the same appear-

ances which have been described in the two preceding preparations.

The right ovarium was large and plump; one half being of a dark colour, resembling ecchymosis. The peritoneal coat in the centre of this part, which was then turgid with blood, was torn and ragged, proving that the ovum had escaped. On making a section of this part, a circumscribed clot of blood resembling that which was described in the former preparation was exposed. On its inner surface the membrane by which it was surrounded, presented the same numerous folds, which were also seen in the preceding specimen, but the appearances were unfortunately destroyed for minute examination, owing to the parts having been steeped in water after the section was made, instead of their having been placed immediately in spirit of wine, which was done in the former case.

The fringed extremities of the Fallopian tubes were tumid and vascular, especially those on the right side.

The difficulty of determining the precise period of impregnation, must render all observations on the human ovum before the middle or near the end of the second month more or less vague and uncertain. After this time the organization of the ovum is so far advanced, that the membranous layers which envelope

the embryo, and the form of the embryo itself, can be clearly perceived with the naked eye. The amnion is then a transparent sac, which contains the embryo and the fluid in which it floats. The chorion covered with villosities on the external surface surrounds the amnion, but is separated from it a short distance by the interposition of a gelatinous fluid which is deposited in a very delicate reticular texture. There is a third membranous layer, viz. the decidua, which completely surrounds the chorion and connects the ovum with the inner surface of the uterus. This, as is well known, appertains not properly to the ovum itself, but is a production of the lining membrane of the uterus; for in cases of extra-uterine conception, the chorion and amnion alone envelope the embryo, and a deciduous membrane has been found lining the cavity of the uterus.

In the accompanying preparation, however, of Fallopian tube conception, which I assisted in removing from the body of a lady who died about the eighth or ninth week of pregnancy from rupture of the tube and internal hemorrhage, no organized deciduous membrane lined the inner surface of the uterus, but the whole of it was coated with a thin layer of soft flocculent albumen.

It is to Dr. William Hunter that the merit is due of having first accurately described and represented in his engravings of the gravid uterus, the disposition of the uterine and reflected deciduous membranes.

He has described the decidua as a very soft, tender, pulpy membrane, which lines the whole cavity of the fundus uteri, reaching to the beginning of the cervix, and passing a little way within the origin of the Fallopian tubes, at which place it is perforated by small openings. Besides that portion of decidua lining the cavity of the fundus uteri, another portion forms an external covering to that part of the chorion, which is not in contact at the inner surface of the placenta, and which he named decidua reflexa. The ovum lies between a part of the decidua vera, or that lining the inner surface of the uterus, and the decidua reflexa, both of which unite into one membrane at the edge of the placenta; or the decidua vera divides itself at the edge of the placenta into two laminæ, one of which passes between the placenta and the inner surface of the uterus, and the other forms the decidua reflexa, which covers the outer surface of the chorion as the pericardium does the heart.

When the decidua reflexa is beginning to pass over the chorion, there is at an early period of pregnancy, an angle formed between it and the decidua, which is often extremely thin and perforated with small openings, so as to look like a piece of lace. In proportion as pregnancy advances, the decidua reflexa becomes gradually thinner and thinner, so that at the fourth month, it forms an extremely fine layer covering the chorion. It comes at the same time more and more closely in contact with the decidua

which lines that part of the uterus to which the placenta is not fixed, till at length they adhere together *.

Dr. Hunter has offered no explanation of the manner in which the decidua reflexa is formed, and Dr. Baillie, who completed his description of the gravid uterus, admits that the manner in which the decidua envelopes the ovum has never yet been observed, and therefore can only be a subject of conjecture. The obscurity which has hitherto prevailed on this subject is probably referable in a great measure to the difficulty which has been experienced by anatomists of procuring the gravid uterus for dissection, at a sufficiently early period with the contents undisturbed. The extent of this difficulty will readily be estimated when I state, that the most early case of pregnancy which Dr. Hunter ever had an opportunity of examining in the dead body was of three complete months, and that his description of the contents of the gravid uterus before this period, was drawn entirely from recent ova expelled in abortion.

The greatest diversity of opinion still prevails respecting the structure and mode of formation of the deciduous membranes, though they have been carefully investigated since the time of Dr. Hunter, by

* An Anatomical Description of the Human Gravid Uterus, by W. Hunter, M.D. pp. 79—83. London, 1794.

many distinguished physiologists. Neither Lobstein, Krummacher, Gardien, Breschet, Dutrochet nor Velpeau, have been able to discover the openings in the decidua, corresponding with the orifices of the Fallopian tubes, and the last of these authors has concluded from his researches, not only that the decidua invariably forms a shut sac in the uterus before the descent of the ovum, but that it is an inorganic layer, and wholly destitute of blood-vessels during the entire period of gestation. According to this view of the disposition of the parts, it is supposed that as the ovum passes through the Fallopian tube into the uterus, it pushes before it the deciduous membrane lying across the orifice of the tube, and thus acquires the thin membranous covering termed decidua reflexa. "L'ovule, après avoir parcouru la trompe, deprime necessairement la membrane caduque pour se glisser entre elle et l'uterus, à la surface interne duquel il finit par se coller: des ce moment, la membrane préexistante se trouve formée de deux portions; l'une, tres grande, tapissant tout l'interieur de la matrice, à l'exception du point qui est en contact avec le germe, porte le nom de caduque uterine ou interne; l'autre, tres petite, deprimée par la moitié inferieure de la vesicule fecondée qu'elle enveloppe, constitue la caduque reflechie, interne ou l'epichorion. L'etendue de la première augmente en même proportion que celle de l'uterus, et l'agrandissement de la seconde suit, de toute necessité, l'acroissement du germe. Aussi la cavité qui les separe, et qui n' est autre que la cavité deformée de l'ampoule primitive, est elle

d'autant plus considerable qu' on s'eloigne moins des premiers temps de la gestation." *

Dr. Burns, who has enjoyed several opportunities of examining the contents of the gravid uterus within a month after conception, has given the same mechanical and erroneous explanation of the formation of the decidua reflexa. "In every case," he observes, "the decidua consisting of two layers is completely formed before the ovum descends. Where the embryo passes down through the tube, it is stopped when it reaches the uterus by the inner layer which goes across the aperture of the tube, and thus would be prevented from falling into the cavity of the uterus, even were it quite loose and unattached. By the growth of the embryo, and the enlargement of the membranes this layer is distended and made to encroach upon the cavity of the uterus, or, more correctly speaking, it grows with the ovum. This distension or growth gradually increases, until at last the whole of the cavity of the uterus is filled up, and the protruded portion of the inner layer of the decidua comes in contact with that portion of the uterus itself which remains attached to the outer layer." †

On the 10th of March, 1832, a young woman who was in the second month of pregnancy poisoned herself with oxalic acid. The uterine organs were re-

* Traité Elementaire des Accouchemens, Tom. I. p. 232.

† Principles of Midwifery. London, 1820. P. 184.

moved from the body without disturbing their contents by W. B. Hutchinson, Esq. house-surgeon to the St. Mary-le-bone Infirmary, and to his kindness I am indebted for the preparation of the parts now exhibited to the Society, and for the opportunity which has so seldom been enjoyed by anatomists of dissecting the gravid uterus before the third month of conception. Both Fallopian tubes in this case were pervious, and the ovum being attached by the placenta to the inferior segment of the uterus, it was obvious that it could not have pressed before it the decidua reflexa in the manner usually represented.

Description of the Uterus and appendages of a Young Woman who poisoned herself in the Second month of pregnancy.

The uterus had acquired double the size which it usually exhibits in the unimpregnated state. It was five inches long, three and a half in the greatest lateral direction, and two inches in the antero-posterior diameter.

A longitudinal incision was carried down the middle of the posterior surface, crossed by a transverse one parallel to the entry of the Fallopian tubes. The thickness of the parietes of the uterus, though greater than in the quiescent state, were not proportionate to the general increase in the dimensions of the viscus, —they were four lines at the fundus and six lines at the cervix, gradually increasing towards that part;

the chief difference was observable in the already enlarged size of the uterine venous sinuses.

The deciduous membrane, which closely adhered to the inner surface of the uterus, was then laid open by two incisions parallel with the longitudinal and transverse incisions previously made in the parietes of the uterus. The cavity of the uterus being exposed, the ovum, about the size of a pullet's egg, came into view, and was observed to be situated towards the lower part of the uterus. The part of the cavity to which it adhered was included between two parallel lines, drawn, the one transversely across the uterus at the distance of half an inch below the entry of the Fallopian tubes, the other at two inches distance from the os tincæ. Consequently the ovum was situated altogether below the entry of the Fallopian tubes, and was unattached both at its upper and lower part, leaving a free space or canal between it and the os tincæ corresponding to the shape of the elongated cervix, and a much larger cavity between the upper part of the ovum and the fundus uteri. But as this latter space is not only inexplicable on the received theories of the formation of the decidua reflexa, but directly at variance with these, it demands a particular and minute description.

Intervening between the superior and unattached surface of the ovum and fundus uteri, was a broad but shallow cavity measuring three inches in the lateral and one inch and a half in the antero-posterior

diameter, and from one to two lines in depth. The upper concave surface of the cavity formed by the decidua lining the fundus uteri, or decidua vera, was irregular and slightly reticulated. The inferior convex surface formed by the decidua covering the ovum, or decidua reflexa, was perfectly smooth, resembling the external serous surface of the uterus. Into this cavity the Fallopian tubes freely opened by palpable orifices; that on the left side by which the ovum had entered the uterus being rather more than a line in diameter, that in the right rather less. The cavity thus formed between the decidua lining the fundus uteri and the decidua covering the upper and unattached portion of the ovum was filled with a red-coloured serous fluid.

The ovum was next laid open by an incision through the chorion parallel with the longitudinal incision of the uterus, and the amnion enclosing the embryo was brought into view. The placenta was situated principally over the cervix and posterior part of the body of the uterus, and the decidua closely adhering to the placenta passed across the upper part of the cervix uteri in the form of a thick reticular membrane. The decidua was then observed to extend upward between the uterus and chorion every where firmly connecting these together as high as the entrance of the Fallopian tubes. From this point the deciduous membrane was spread out in two different directions, viz. over the upper convex and unattached surface of the ovum, and over the whole concave surface of the fundus uteri, so as to form the cavity above described

into which the Fallopian tubes freely opened. The deciduous membrane interposed between the ovum and uterus exhibited the usual degree of development and of organization. Where it passed off from the uterus to cover the upper surface of the ovum, it was somewhat thicker than elsewhere, and was divisible into two distinct layers. The tufts of vessels of which the placenta is constituted were more distinct from each other than they subsequently become, and they filled the entire space between the chorion and decidua. The appearance of a division of the placenta into a fœtal and maternal portion did not exist. The different parts of this interesting and most beautiful preparation have been faithfully represented by Mr. Perry, in the accompanying drawing *.

If the statements of the authors above alluded to and the generally received opinions respecting the formation of the decidua reflexa be well founded, it would follow, that in all cases the ovum would attach itself to the uterus by the placenta, either directly over the edges of the orifice of the Fallopian tube, through which it had descended, or to its immediate vicinity, and that the deciduous membrane would never be found interposed between the uterus and placenta, as it invariably is. The facts which I have now adduced, clearly demonstrate, that the Fallopian tubes are open in the early months of gestation; that the ovum may attach itself by the placenta to the fundus

* See Plate III.

body, cervix or over the os uteri, and that the deciduous membrane forms neither a shut sac nor inorganic layer, prior or subsequent to the arrival of the ovum in the cavity of the uterus. These circumstances are also strictly in accordance with the fact that when the ovum can first be perceived, it lies loosely imbedded in the soft flocculent albuminous matter which at this period of gestation coats the inner surface of the uterus, and that this pulpy semifluid matter becomes gradually converted into those delicate organized membranous layers, by which the attachment of the ovum to the uterus is so firmly secured during the whole period of pregnancy. The albuminous substance interposed between the uterus and ovum becomes the decidua uteri or decidua vera, while the albumen which envelopes the unattached hemisphere of the ovum becomes the decidua reflexa. To whatever part of the uterus the ovum adheres by the placenta, its relation to the deciduous membranes will be the same, the decidua vera forming the connecting membrane between the ovum and uterus, and the decidua reflexa covering only that part of the chorion which hangs loose within the cavity of the uterus.

From the circumstances now detailed, it also follows that the names decidua uteri and decidua reflexa are improper, in so far as they are founded on speculative ideas regarding the mode in which these membranes are formed, and which, if not positively erroneous, are at least by no means demonstrated. It

would be preferable to distinguish these membranes not in this hypothetical manner, but from their anatomical relations, which must be true, whatever be the fate of our conjectures; and I therefore propose to denominate them respectively decidua uteri and decidua ovuli or uterine and ovuline decidua *.

At the end of the fourth month of gestation, when the ovum has enlarged so as to fill the entire cavity of the uterus, the decidua uteri and the decidua ovuli coalesce, and during the remainder of pregnancy form a thin, soft, pulpy membrane which is closely united to the inner surface of the uterus, by numerous small tortuous blood-vessels and flocculent fibres. At this period also the villosities of the chorion have disappeared, where the placenta does not exist, and the amnion, the chorion, and the decidua have become so firmly adherent to one another that they constitute a membranous sac consisting actually but of one layer, though susceptible of being artificially divided into three distinct laminæ. M. Velpeau asserts, that the decidua uteri, and decidua ovuli remain distinct membranes until the end of pregnancy, but in seven gravid uteri near the full period, which I have examined, I have never perceived more than three concentric layers in any part of the fœtal membranes. The existence of numerous blood-vessels, proceeding from the lining membrane of the uterus to the de-

* The term ovuline decidua I have adopted at the suggestion of my ingenious friend Mr. Owen.

cidua, which has also been denied by the same writer, is clearly demonstrated by the preparations of the gravid uterus in the Royal College of Surgeons in London, and it scarcely admits of a doubt, that these vessels serve not merely to supply nourishment to the membranes which envelope the fœtus, but that they enable the amnion to secrete the fluid contained within its cavity. The numerous small arteries which proceed from the inner surface of the uterus to the decidua covering the placenta are also, I conceive, solely destined to perform the function of supplying this organ with nourishment, and not, as has generally been supposed, to effect certain changes in the fœtal blood as it circulates in the vessels of the placenta.

In a paper recently published on the structure of the human placenta and its connexion with the uterus, I have given the following concise description of the placental decidua, and of the appearances in the corresponding part of the uterus. This description was drawn from a careful examination of six gravid uteri, in which the natural relation of the placenta to the uterus had not been destroyed by the forcible injection of extraneous matter into the spermatic and hypogastric arteries ; and its accuracy appeared to be confirmed by the appearances observed in the vascular preparations of the gravid uterus in the Hunterian Museum at Glasgow, and Royal College of Surgeons in London, and by dissections of the uterus and placenta, performed under water, by Mr. Owen.

"At the circumference of the placenta, the decidua separates from the chorion and amnion to pass between the uterus and placenta, and thus forms a complete membranous septum, which is interposed betwixt these organs. The chorion and amnion cover the fœtal surface of the placenta; and between these two membranes and the decidua lie the ramifications of the umbilical vein, and arteries subdivided to an almost indefinite extent, and connected together by white slender filaments running in various directions. The placenta thus consists solely of a congeries of the umbilical vessels, covered on the fœtal surface by the chorion and amnion, and on the uterine surface by the deciduous membrane, and inclosed between these membranes; it adheres to the fundus, or some part of the uterus by innumerable flocculent fibres and vessels.

"On detaching the placenta carefully from the uterus, the deciduous membrane is found to adhere so closely to the umbilical vessels which it covers, that it is impossible to remove it without tearing these vessels. With the fibres uniting the placental decidua to the uterus are mingled small blood-vessels, proceeding from the inner membrane of the uterus to the decidua; and these vessels, though more numerous at the connexion of the placenta with the uterus, exist universally throughout the whole extent of the membrane. There is no vestige of the passage of any great blood-vessel, either artery or vein, through the

intervening decidua from the uterus to the placenta; nor has the appearance of the orifice of a vessel been discovered, even with the help of a magnifier, on the uterine surface of the placenta. This surface of the placenta deprived of the deciduous membrane presents a mass of floating vessels, its texture being extremely soft and easily torn; and no cells are discernible in its structure, by the minutest examination.

"At that part of the surface of the uterus to which the placenta has been adherent, there are observable a great number of openings leading obliquely through the inner membrane of the uterus, and large enough to admit the point of the little finger; their edges are perfectly smooth, and present not the slightest appearance of having been lacerated by the removal of the placenta. In some places they have a semilunar or elliptical form, and in others they resemble a double valvular aperture. Over these openings in the inner membrane of the uterus, the placenta, covered by deciduous membrane, is directly applied and closes them in such a manner that the maternal blood, as it flows in the uterine sinuses, cannot possibly escape either into the cavity of the uterus or into the substance of the placenta.

"When air is forcibly thrown either into the spermatic arteries or veins, the whole inner membrane of the uterus is raised by it; but none of the air passes across the deciduous membrane into the placenta, nor does it escape from the semilunar

openings in the inner membrane of the uterus, until the attachment of the deciduous membrane to the uterus is destroyed. There are no openings in the deciduous membrane corresponding with these valvular apertures now described, in the internal membranes of the uterus.

"If a placenta be examined which has recently been separated from the uterus in natural labour without any artificial force having been employed, its surface will be found uniformly smooth and covered with the deciduous membrane; which could not be the case did any large vessels connect it with the uterus. The placenta, in a great majority of cases, is also detached from the uterus after labour, with the least imaginable force; which would be impossible if a union by large blood-vessels, possessing the ordinary strength of arteries and veins actually existed. Besides a vascular connexion of such a kind would be likely to give rise, in every case, to dangerous hemorrhage subsequent to parturition, a circumstance not in accordance with daily experience." *

The accuracy of the preceding anatomical description of the relations of the uterus and placenta, I have recently had an opportunity of confirming to the fullest extent, by examining (through the kindness of Mr. Alexander Shaw) a gravid uterus in the sixth month of pregnancy. The experiments of the

* Philosophical Transactions, 1832. Part I. p. 57.

Hunters, of Dubois, Chaussier, Beclard, Williams, Biancini, Burns, and others, prove that if size, mercury, oil of turpentine, &c. be injected into the spermatic, or hypogastric arteries of the gravid uterus, they will pass not only into the substance of the placenta, but sometimes into the blood-vessels and organs of the fœtus itself. To those observers who have adopted the views of the Hunters, and who neglect, or obstinately refuse, to examine the connexions of the uterus and placenta, before they have been disturbed by the forcible injection of extraneous matters into the uterine blood-vessels, such experiments will probably be considered as demonstrating the existence of a cellular structure in the placenta, and of a free communication by great arteries and veins between these cells and the uterus. That no such communication, however, exists in nature, and that the appearances produced by injection are completely fallacious, may readily be demonstrated, by an examination of the parts in the manner I have pointed out. The numerous small tortuous blood-vessels which proceed from the uterus to the placenta, are nutrient vessels of the placenta, and never terminate in cells, and the uterine sinuses do not penetrate the decidua, but open into the cavity of the uterus by smooth and large valvular-like orifices in its lining membrane. The whole of the blood sent to the uterus by the spermatic and hypogastric arteries, except the small portion supplied to its parietes, and to the membrana decidua by the inner membrane of the uterus, flows into the uterine veins and sinuses, and after circulating through them,

is returned into the general circulation of the mother, by the spermatic and hypogastric veins, without entering the substance of the placenta. The deciduous membrane being interposed between the umbilical vessels and the uterus, whatever changes take place in the fœtal blood, must result from the indirect exposure of this fluid, as it circulates through the placenta, to the maternal blood flowing in the great uterine sinuses.

POSTSCRIPT.

While correcting the press, I received from Charles Millard, Esq., Demonstrator of Anatomy in the School of Webb Street, the following interesting description of the appearances which he observed in a gravid uterus of seven months.

" Dean Street, Southwark,
September 18th, 1832.

" MY DEAR SIR,

" As concurrent testimony on any, even the clearest subjects, is sometimes of use, I beg to forward to you the following account of the dissection of a healthy uterus, at about the seventh month of pregnancy, which I had an opportunity of examining through the kindness of Dr. Holroyd of Harley Street, who obtained the specimen from the body of a woman who died of cholera. The parts were examined without any previous injection or other preparation, that every thing might be seen in its natural state.

" On making an incision through the anterior wall of the uterus, the attention was immediately arrested by the large size of the uterine veins, especially of those in the neighbourhood of the placenta. The right side of the anterior wall of the uterus was then carefully turned back, and with such ease as to convince me that no large vessels were torn through: the tunica decidua was now distinctly seen passing behind the placenta, and it was also observed to pass over the orifice of the Fallopian tube. The other side of the uterus was then carefully examined under water, principally with a view to ascertain the direction and termination of the uterine veins, and the connexion that exists between the uterus and placenta. This examination completely coincided with your description. The uterine veins passed in an oblique direction as regards the placenta, and not immediately towards it, and in no instance could they be traced into its structure, for whether they were followed from the external to the internal surface of the uterus, or in the opposite direction, they were found to present a number of large valvular openings, some of an elliptical and some of a semicircular form, situated in the sides of the veins, and having no corresponding openings on the outer surface of the placenta, but closed by the deciduous membrane. All these openings had distinct, well defined edges, formed, apparently, by a duplicature of the lining membrane of the uterus, and quite unlike ruptured vessels; indeed, as I have before stated, none of these veins could be followed into the placenta, even by the

most careful examination. But both arteries and veins, not larger than a bristle, were readily traced from the surface of the uterus to the tunica decidua covering the uterine surface of the placenta, where they ramified very minutely. Some of these were distended by inflating the large uterine veins, but no air could be made to pass from these vessels into the substance of the placenta, although the inner membrane was distinctly raised by it. The uterus was farther connected to the placenta by a quantity of pulpy cellular membrane, which easily broke down under the finger.

" Believe me, my dear Sir,

" Yours very truly,

" To Dr. Lee." " C. MILLARD."

CASE

IN WHICH

A CYST CONTAINING HYDATIDS

WAS

FOUND IN THE SUBSTANCE

OF

THE HEART.

BY HERBERT R. EVANS, ESQ., SURGEON.

COMMUNICATED BY EDWARD STANLEY, ESQ., F.R.S.

The morbid appearances observed in the following case are of such rare occurrence, that it may not be uninteresting to the profession to have the particulars of it placed on record.

The subject of it was an unmarried female of about forty years of age, of slender make and weakly appearance, but who had generally enjoyed good health. During the last few years, however, she found her health somewhat decline; she was languid and indisposed to exertion, and was observed to be irritable. Since the beginning of last winter, especially, her strength failed, and she found that efforts which were

formerly easy to her, were now performed with difficulty. This was particularly the case in walking up any rising ground, or mounting a staircase: such movements she avoided as much as possible in consequence, but when she persisted in them, the result was extreme fatigue and shortness of breath.

These symptoms increased, and added to them she felt occasionally a sharp pain dart through her heart; it was momentary but most intense—so as to cause her to remark, that "it must be with such pains that people die suddenly." As these sufferings, however, were transient, she did not pay much attention to them, but continued her usual occupation (of nurse) until the 20th of April, when, after running down stairs and up again rather quickly, she was seized with a violent paroxysm of dyspnœa, attended by throbbing and pain of the heart, which compelled her to go to bed, and from this moment she was never again able to leave it. She remarked to her companion, that she felt as if her heart had leapt from its place. The pain subsided a little by rest, but was followed by vomiting and purging to some extent. During the night, the effort of sitting up for the purpose of relieving the bowels, induced more than once a state of complete syncope, which lasted for some time.

On the following morning I saw her for the first time. She was much exhausted and felt very faint: the skin was bleached and the countenance sallow

and sunken. The pulse was so rapid as to be countless; having the feel of a continued vibration of the vessel rather than of a *pulse*. The carotids and other large vessels also vibrated strongly. The motion of the heart was sudden, jerking, and violent; its force seemed to increase under the pressure of the hand; it was felt over a large extent of the chest, and below the sternum. The respiration was very hurried and laborious, and required a raised position of body for its performance in any degree of comfort. The pain in the chest had nearly subsided.

By the ordinary means the diarrhœa was checked, but the sickness was rather obstinate. From this period until the time of the patient's death, there was but little variation in the symptoms. She felt constantly faint and gasping; the pulsation in the large vessels and heart became stronger, and the action of the latter was felt over a larger surface of the chest; the least exertion, even that of turning round in bed, produced great palpitation and dyspnœa; and occasionally without any such cause, paroxysms of difficult breathing so severe as to threaten dissolution, came on and lasted for hours. Once or twice, just after such paroxysms had subsided, the pulse became for a few hours more distinct, and might almost be counted. There was little sleep, and that little was disturbed and unrefreshing. The urine was scanty, but the extremities did not swell. The legs were often affected with severe cramps. Her strength gradually failed, and on the 1st of June she died.

The treatment was, of necessity, chiefly of the palliative kind, and but little effect was produced by it upon the disease. Once, the state of the symptoms permitting it, blood was taken from the region of the heart by leeches, and blisters afterwards applied: a slight and temporary benefit only was the result. The use of mercury combined with opium was pushed to the extent of affecting the gums: but this merely added a new source of sufferings, without relieving those already present. Large doses of opium and other anodynes, had not much effect either in alleviating the symptoms or producing sleep.

The body was examined thirty-six hours after death. On removing the ribs, the heart had the appearance of being much larger than usual. The cavity of the pericardium contained about an ounce of fluid. The membrane was coated by a layer of coagulable lymph over a small extent of its front surface. The apex of the heart was lost in a considerable tumour, apparently an elongation of the heart itself, and covered on all sides by pericardium. The tumour fluctuated to the touch, and there was an appearance on its surface as of cells within. On opening the heart this new growth was seen forming a round and considerable projection into the cavity of the right ventricle at its apex. It was smooth and polished, covered by the lining of the ventricle, and occupied about one fourth of its cavity. The tumour was globular, and about three inches in diameter. An opening being made into it from the interior, it

was found to be a cyst, containing a number of hydatids, varying in size from that of a pea to that of a pigeon's egg, the interstices between them being filled up by a soft curd-like substance of a yellow colour. The hydatids were precisely of the same character as those usually found in the human liver. On the inner side the cyst was covered by the lining of the ventricle only: but exteriorly, the muscular substance of the heart, considerably thinned, lay between it and the pericardium; hence it appears that the disease had its origin in the muscular substance of the heart. The other parts of the organ were natural.

The heart is preserved in the Museum of St. Bartholomew's Hospital.

Although hydatids are so commonly found in many parts of the body, it is very rarely that they are met with in the heart. The Transactions of this Society * contain the particulars of a case in which "a large hydatid was found in the muscular substance of the heart." Andral † mentions having seen these vesicles of the size of a nut in the heart of a patient who died at La Charité. I have not been able to find any other unequivocal instance of hydatid discovered in this viscus. The older writers, indeed, make mention of cysts in the heart, but their descriptions are too vague to enable us to identify such bodies with the true hydatid.

Hampstead, June 26, 1832.

* Volume XI. Part II. † Anatomie Pathologique.

EXPLANATION OF THE PLATES.

PLATE I.

REPRESENTS THE TWO CURVED TROCARS DESCRIBED BY MR. WOOD, IN HIS PAPER.

Fig. 1. Shows the instrument, with a lancet point, enclosed in its canula.

Fig. 2. Represents the canula itself, and

Fig 3. Displays the jointed construction of the trocar, by which it is made to accommodate itself to the curvature of the canula.

PLATE II.

TO ILLUSTRATE DR. ROBERT LEE'S PAPER ON DOUBLE UTERUS.

a. The cervix uteri.

b. The right cornu which contained the fœtus.

c. The left cornu lined with deciduous membrane.

d. The uterine orifice of the Fallopian tube into which the decidua entered, leaving it pervious.

PLATE III.

TO ILLUSTRATE DR. ROBERT LEE'S OBSERVATIONS ON THE MEMBRANES OF THE HUMAN OVUM.

a. The entrance of the left Fallopian tube into the uterus.

b. The uterine orifice of the right Fallopian tube, also pervious.

c. The decidua vera or decidua uteri coating the inner surface of the fundus of the uterus.

d. The decidua ovuli or decidua reflexa covering that portion of the ovum which is not attached to the uterus.

e. The decidua vera passing down between the uterus and placenta.

f. The chorion.

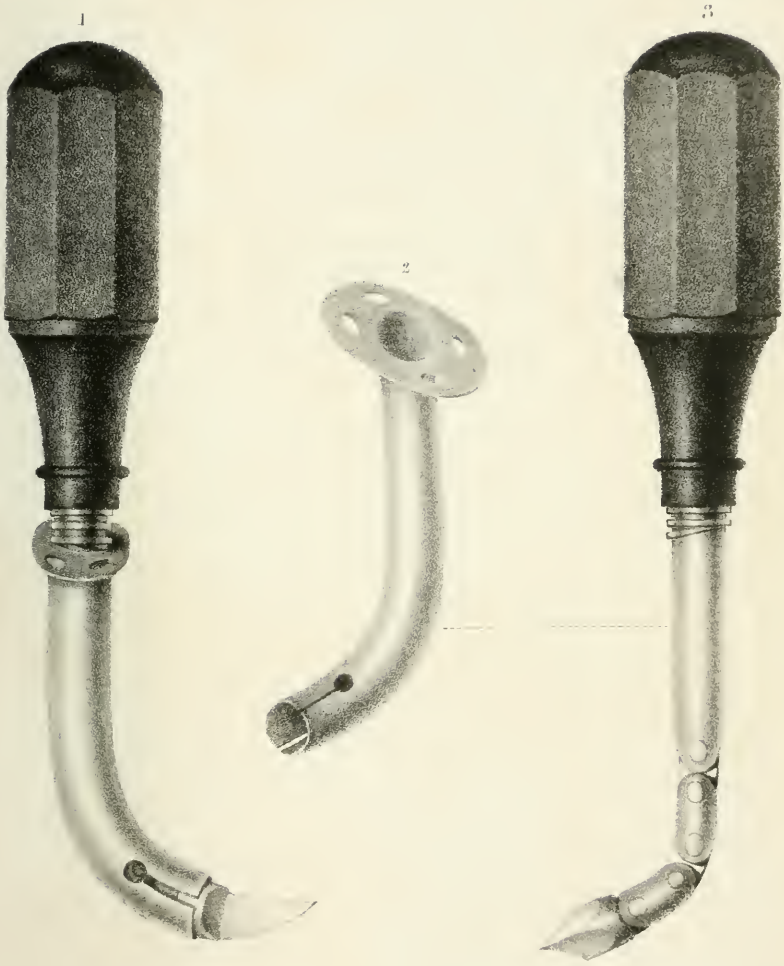
g. The amnion.

h. The placenta occupying the space between the chorion and decidua uteri; this latter membrane passing across the upper part of the cervix uteri.

PLATE IV.

REPRESENTS THE HEART CONTAINING HYDATIDS, DESCRIBED IN MR. EVANS'S PAPER.

Exhibits a portion of the wall of the left ventricle turned down to display the hydatids in their cyst, with the yellow curd-like substance between them.



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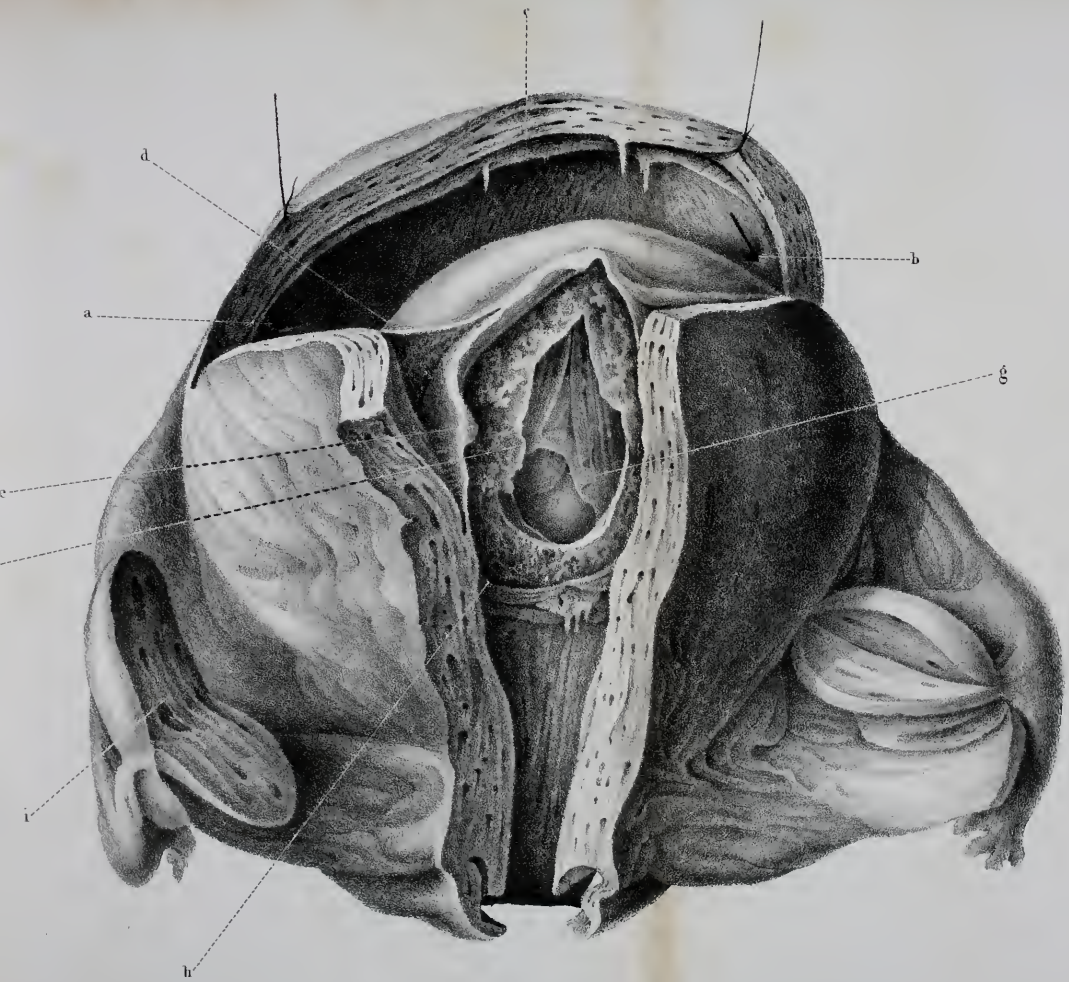

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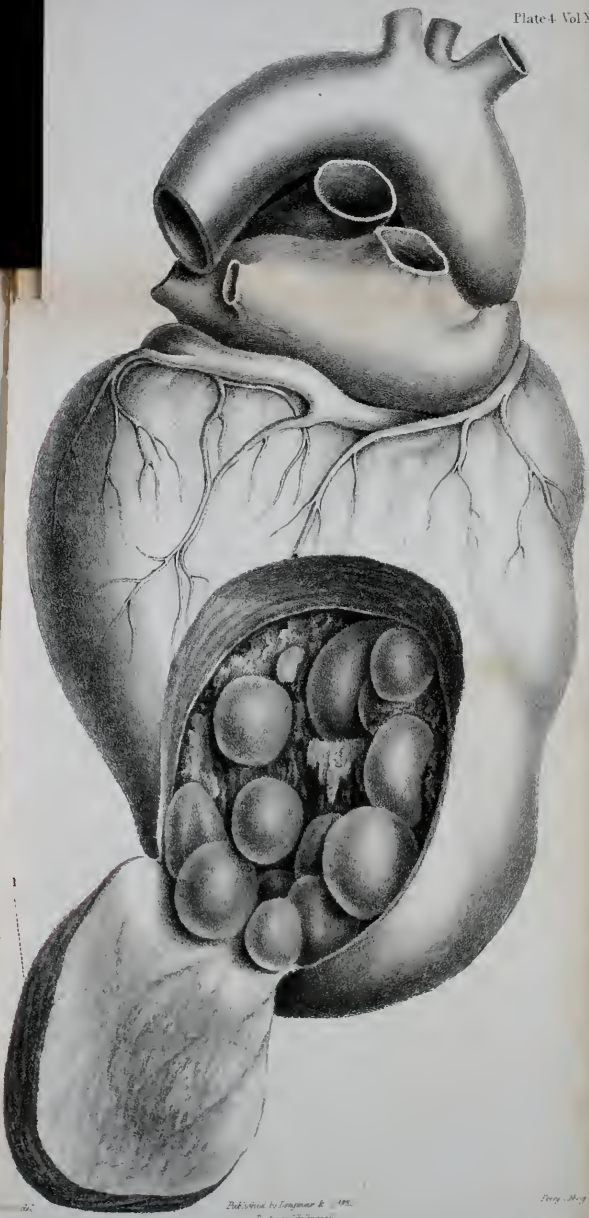

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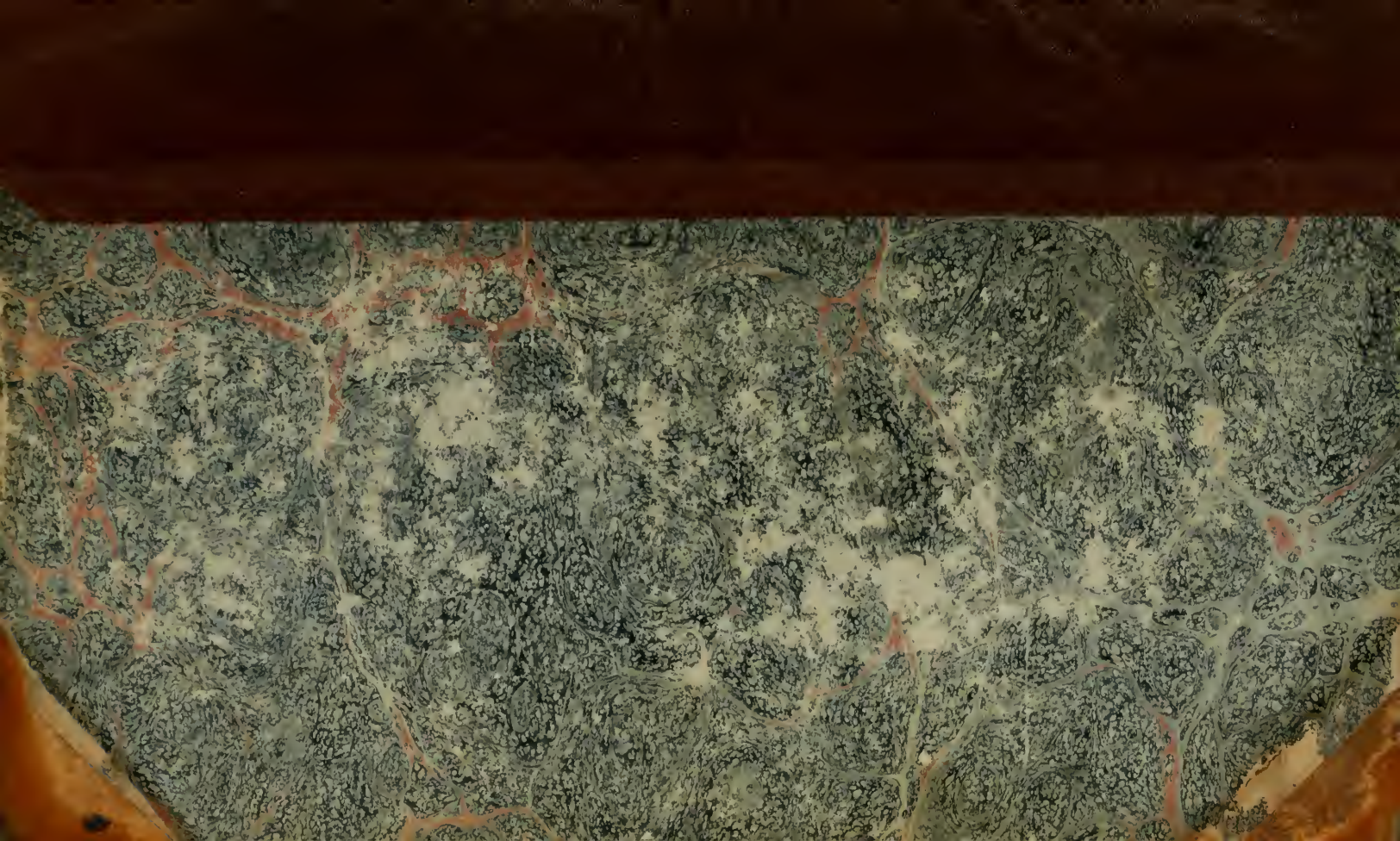
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